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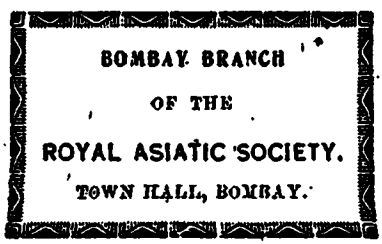

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THE JOURNAL OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY.

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VOL. I.

JULY 1841 TO JULY 1844.

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BOMBAY:
AMERICAN MISSION PRESS.
T. GRAHAM, PRINTER.

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PREFACE.

On completing this 1st Volume of the Journal of the *Bombay Branch of the Royal Asiatic Society*, it becomes the duty of the present Editor to briefly notice how far the Transactions of the Society have contributed to extend our knowledge on subjects of oriental research, more particularly connected with the Antiquities, Philology, Geography, and History of Western India. While this Society was instituted twenty years subsequently to that of Calcutta, and its field of investigation was necessarily more limited, it derived a healthy activity, from the accomplished character and talents of its President, Sir James Mackintosh, who, combining kindness of manner, extensive literary acquirements, and much soundness of judgment, was singularly adapted to promote the views of a Society which, on his arrival in India, had entered into generous competition, in oriental research, with its elder sister of Calcutta. With all the ardent love of knowledge characterizing Sir Willam Jones, but without his oriental acquirements, Sir James Mackintosh successfully promoted the objects of the Society, by encouraging all, possessing opportunities of obtaining information, to collect and record it: and in doing so, gave an impulse to its labours that enabled it to obtain valuable materials for its volumes: for, as Sir John Malcolm says of him, "The labours of an individual can effect little, but the genius that can stimulate and direct numbers, can effect every thing." Three quarto volumes published by this Society, commencing with the year 1804, and terminating with that of 1821, met with a most liberal

and distinguished reception, among the Literati of England and the Continent; and are now so much in request, as a standard work for libraries, that, from the small impression originally printed, the volumes are now with difficulty procurable. Under these circumstances the Society has resolved, as may be seen by reference to its proceedings, that a new edition of the work, in three volumes octavo, with a quarto volume of plates, shall be published, in London, by Messrs. Longman & Co. provided the names of an hundred subscribers be procurable.

Soon after the institution of the Royal Asiatic Society of Great Britain and Ireland, the labours of the then Literary Society of Bombay merged in those of the now Parent Institution, agreeably to the resolutions, moved by the Honorable the President, Sir John Malcolm, and unanimously agreed to at a special meeting of the Society, held on Wednesday the 5th December 1827.

1st. That this Society deems it extremely desirable, that measures should be adopted without delay for opening a communication with the Royal Asiatic Society of Great Britain and Ireland, and soliciting the formation of a connexion with that body, in order to give greater efficiency to the Literary and Scientific pursuits of this Society, and in the hope of contributing by such an alliance to the more effectual promotion of the common cause in which the two associations are engaged.

2nd. That it be referred to the consideration of a Special Committee, to report for the information of the Society, on the best method of accomplishing such an union.

From this period to 1841 all literary communications, forwarded by members to the Bombay Society, were transmitted home; and have been published in the Transactions of the Parent Institution, or in the pages of its quarterly octavo Journal. But in ceasing to act independently, by the publication of

the literary labours of its members, the Bombay Society discovered that it had lost the greater part of its activity and usefulness; while the Societies of Bengal and Madras were extending the bounds of oriental knowledge by the separate publication of their Transactions. At a general meeting of the Society, held on the 10th of February 1841, it was unanimously carried,—That a Quarterly Journal, in connection with this Society, on the plan of those published under the auspices of the Asiatic Society of Bengal, and the Madras Branch of the Royal Asiatic Society, be established, and that Mr. Orlebar, the Secretary, be requested to undertake the duty of Editor; and that the Society take upon itself the pecuniary responsibility for one year, and furnish a copy to each of its members in India.

In conformity with this resolution, the two first numbers of the present volume were published under Professor Orlebar's superintendence: but the state of his health obliging him to leave India for England, in May 1842, he was succeeded by the late lamented Secretary Dr. John Grant Malcolmson; who, with all the natural zeal and intelligence of his character, laboured unweariedly to elevate the character of the Society's Journal, to establish its museum, to arrange its library, and reconstruct its catalogue. Any lengthened eulogium on the character of this estimable individual would be here misplaced and is unnecessary: since the record of his merits, in reference to the Society, will be best seen in the Resolution it has adopted, "that with a view of perpetuating his memory, the Society do accord yearly a gold medal, to be designated, "the Malcolmson Medal," to the author of the best paper presented to the Society on the Natural History and Literature of India, points on which the late lamented Secretary evinced the deepest interest."

We are yet far from having exhausted subjects of oriental research in regard to India; and the more we extend our investi-

gation, into the languages, antiquities, and history of the neighbouring countries, we will find them replete with matter of curiosity and interest. The origin of a *Semitic* alphabet, kindred with the *Palmyrine* and *Sassanian* writing, and adapted to a language of the *Sanskrit* family, as seen on the Bactrian coins and the inscriptions from *Shah Baz Ghari*, in the Yeusaf Zai country, affords matter for much ingenious reflection and investigation: and the *Hamaiyaric* inscriptions, found in the Southern coast of Arabia, connected as they are with the history of the opposite coast of *Axum* and *Ethiopia*, are equally subjects of deep curiosity. Success has already, I hope, attended both investigations: and translations of the inscription lately sent fro Aden, by Captain Haines, and of those obtained, from *Mareb* or *Saba*, by the late Dr. Mackell, will appear in an early number of the Journal: which, with the assistance of friends, and the encouragement of the Society, the Editor hopes he will be able to regularly publish quarterly.

Bombay, 30th June, 1844.

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JOURNAL

OF THE

BOMBAY
BRANCH ROYAL ASIATIC SOCIETY.

JULY—1841.

ART. I.—*An Essay on the Vernacular Literature of the Marathas, by the Reverend* DR. STEVENSON.

The Marathas have been long famed throughout India for their warlike prowess and martial deeds; and their history has been written not only by natives of the country, but has been deemed worthy of being transmitted to posterity in a distinct work in our own language. It has, however, I fear, been by all, except a few, generally supposed that they were destitute of any vernacular literature; in fact, that the nation which, issuing from the Deccan, rolled back the tide of Mahommedan conquest, gave laws to the Emperor of Delhi, and disputed the sovereignty of India with our countrymen, was little better than a horde of barbarians. The literature of the Marathas cannot indeed be compared with that of European nations, but they are by no means so far behind in literary matters as has often been supposed. The Brahminical portion of them can vie in their acquaintance with the common stores of Sanscrit literature with the Brahmins of most provinces in India: nor have there been wanting instances—as in the case of Sridhara, who wrote comments on the Bhagavat—of writers who have added their contributions to the general treasury. The Marathas have, besides, a literature of their own written in a dialect called the Pracrit. This Pracrit, as will fully appear from the specimens afterwards to be given, is nothing but the present spoken language in an antique dress, and without any of the modern additions to the language introduced by the Mahomedans. People, indeed, in familiar conversations, call all the spoken languages of India Pracrit; but this dialect, which was probably that used by their fathers three or

four centuries ago, is so named by way of eminence. The basis of the Pracrit, as of all the languages of Northern India, seems at first to be entirely Sanscrit; but I have given reasons elsewhere for believing, and hope soon to be able to prove by a fuller induction, that there is another aboriginal language of India, different from the Sanscrit, which has united with the language of the Brahmins in forming the different dialects now spoken in Hindustan, and in the island of Ceylon. However this may be, it is in this Pracrit that most of the literary works in repute among the Marathas are written. It is also in similar antiquated dialects of Hindavi, Telugu, Canadi, Tamil, Singhalese, &c., that literary works in other provinces of India are chiefly written, just as if modern English writers were to adopt the phraseology and style of Spencer and Chaucer. It is a singular fact also, and illustrative of a general principle developed in other parts of the world, that almost without exception all these Pracrit works are written in verse. Notwithstanding, however, this predeliction for the antique, and love of poetic measures, the stirring events connected with the rise of the Maratha empire, and progress of the arms of their confederacy, excited men to write who could not be confined by such trammels. The soldier and the statesman in retirement committed their facts and observations to paper in the same style that they had been in the habit of rehearsing their own exploits, or those of their patron leader, to the select circle of friends; hence the origin of the historical treatises called Bokhars, written in the language at present spoken by the Marathas. The substance of these Bokhars having been extracted by Grant Duff in his history of the Marathas, and my partial acquaintance with them having led me to form the idea, that in a literary point of view they are of an inferior order, abounding in dry details, and making too free a use of Persian and Arabic words to serve as models of style, I shall not here notice them any farther. Most of them, I believe, have a place in the Mackenzie collection of manuscripts, and will supply materials for those who wish to make more extended and minute historical researches. It is to the Pracrit literature, then, that on the present occasion we will confine our attention; it is to this that we must mainly have recourse for the history of mind among the Marathas. This is the source also whence the present style of Maratha composition must be improved, and a purely Indian Maratha introduced without superfluous foreign additions.

It is a singular fact, that most of the authors among the Marathas who have written in the vernacular tongue have been Vaishnavas, and by far the greater proportion Bandho Vaishnavas. There is not a single Saiva author among them of any eminence; and yet four-fifths of the Brahmins, and others who cultivate literature, are votaries of Siva. This does not arise from any inferiority of genius, but from contempt of the vernacular languages in the Saivas, and, like the schoolmen of the middle ages in Europe, their esteeming no modern dialect either worthy or capable of conveying to posterity the truths of religion and philosophy. The liberal feeling of the Bandho Vaishnavas, on the contrary, has excited them to make an effort to communicate their ideas to the people in a language intelligible to all, and to break down the barriers which for ages had debarred the populace from all access to any more knowledge than a man's particular spiritual guide could or would communicate. They accordingly are the fathers of Maratha literature; and the most distinguished literary characters that have appeared in Maharashtra have belonged to their sect.

The oldest Pracrit writer, whose name and writings have come down to posterity, is Nama; usually called Nam Deva. He is said to have been a foundling, and to have been brought up in the family of a tailor, whose profession he followed in after life. Nama, as we have already seen, was one of the first disciples of Pundalika,* who established an ecclesiastic Hinduism at Pandharpur about the beginning of the 14th century of our era. His writings consist of moral and religious precepts delivered in metrical poems called Abhanys.

The Abhany is a trochaic ode, the verses of which consist of four, three, or two feet; every two lines rhyming with one another, and consisting generally of from four to thirty lines. This kind of verse is regulated by the accent of the words, as in English and other European languages, and not by the length of the syllables, as in Sanscrit, Greek, and Latin.

Nama carried out his theories into practice so far as to have his household instructed in those branches of knowledge with which he himself was acquainted. One of his female slaves, Zana Bai, became herself an authoress, and some of her Abhanys have been handed down to posterity. Although but a slave girl, she was a virtuous

* Pundalika is probably a name of Vishnu adopted by that half Brahminical, half Buddhist sage. It is probably the same word as Pundarekaby, under which name also he is occasionally mentioned, and which is undoubtedly a name of Vishnu.

woman, nor do even the Saiva Brahmins accuse her of the want of any of the proprieties of her sex, although put in possession of an instrument they profess to deem dangerous in the hands of a female.

The example of Zana Bai was followed by Mukta-bai, the sister of Dnanoba, of whom more particular mention will afterwards be made. Some of her Abhanys also are preserved. The following, an ode displaying no mean talent and acuteness, is a favourable specimen of her style of composition. In reading it, it is to be kept in mind that its end is to show the superiority of divine knowledge to ritual observances :—

१ शिवानी गायत्री विष्णूनी संध्य ब्रम्हीयासीं विद्या पाठ केली

२ स्नान संध्यानेम साही शास्त्रें पुराणें ब्रम्हीयासीं विद्यादान संकल्पिलें

३ जपतप विद्या मार्ग सांगाव्याकारणें याग आणि यज्ञ संकल्पिलें

४ माझीया प्रेमाचेंस्वयेंची सोवळें सर्व भूतीं केलीं पुज्य हो

५ सकल तिर्थाचा ब्रम्हा आधिकारी पुज्यल्याविण शरीरीं शुध नव्हें

६ जाणोनी जाणीव ठेविग्येले वर्म मग कर्म सांगितलें

७ आधी मुंज्य बंधन विष्णूने ब्रम्हीयासीं मग तीन्ही कर्मे त्यासीं बांधियेलीं

८ म्हणे मुक्ताबाई जाणोनी जाणावें वर्म मग तें नाव कर्म कोण

"Siva taught Brahma the Gayatri, and Vishnu taught him the daily "prayers. They then instructed Brahma in the ceremonial of bathing, "with the accompanying prayers ; and also in the six shastras, and "puranas. For making him an adept in the performance of austerities "and all ritual observances, they also initiated him into the way of per- "forming the different kinds of sacrifice. But if divine love dwell in "my breast, I am necessarily pure, and all creation subject to me. And "how should my body be free from ceremonial defilement, unless I "reverence Brahma, who is lord of all the holy places? To "know what may be known was laid down as the thing essential ;

" afterwards works were enjoined. First Vishnu initiated Brahma into " science, and then imposed on him the three kinds of ceremonial " works. To know what may be known is the essential thing. What " means then that term works ?"

Thus inquires Mukta-bai Dnanoba, one of the most celebrated Pracrit writers, who was a fellow disciple with Nama of Pundalika. His father was by birth a Brahmin, but soon after his marriage, before he had any family, became a Sanyasi, and bid adieu to the world. The head Sanyasi of the establishment at Benares, whither he had gone, shortly after, in his way to visit the holy places in the south, stopped at Alandi near *Punah*, the residence of the young Sanyasi's wife, whom he saw performing her worship with great intensity of mind. Without knowing her, or the state in which she was left, he gave her a blessing, promising her four children. An explanation ensued, the result of which was, that the old Sanyasi started immediately for Benares, and sent back his brother to his wife. The Brahmins would however neither receive him nor his children into caste, till Dnanoba and his brothers had convinced all the learned men at Paithan that he and his brothers were under the special protection of the deity. Dnanoba composed not only Abhanys, but a commentary also on the Bhagavat-Gita for the sake of those who did not understand the Sanscrit ; a work in great repute among the Marathas, but now in some places as difficult to understand as the original. He and his two brothers Sopaudeva and Nivrittee were reckoned incarnations of Vishnu, Brahma, and Siva ; and their sister the incarnation of Brahmi.

All of them were authors, but Dnanoba by his superior glory has obscured the splendour of all the rest. The date of the Commentary on the Gita mentioned above is Salivahana Salea 1212. A. D. 1290. If then we allow fifteen years to have elapsed since the introduction of the Eclectic system of Pandharpur,—only a reasonable time to permit matters to proceed so far as to give birth to such a work,—the rise of the Bandho Vaishnavas may be dated a quarter of a century earlier than we ventured to do in a former paper, and so we may assign their origin to the last quarter of the thirteenth, instead of the beginning of the fourteenth century of our era. The above mentioned date I have ascertained from two or three different manuscripts, all of which agree ; and as it comes so near my former computation from the genealogy of Sridhar's family, con-

tained in another work, I think considerable confidence may be placed on it.*

From this time onward, such moral odes as we have already described seem to have been produced by several authors, some of whose names have been handed down to posterity. One of them, Atmanayaka, a collection of whose Abhanys I have seen, was a Mahar,—a class of people, who, though not properly outcastes, are not permitted to have any communication even with the lowest caste into which regular Hindus are divided, and are either the descendants of the aboriginal inhabitants who were not received into the Hindu association, or of persons who, at some later period, had been expelled from society.

Some time, also, after Dnanoba, another famous writer, called Eknath, flourished. I have not seen any of his larger works, and cannot determine more nearly the particular time at which he lived. His most celebrated work is a translation of a portion of the Bhagavat. He was a Bandho Vishnava, and got into difficulties with the Brahmins about his caste, on account of the attention he paid to a religious Mahar in supplying him with food as he passed his house on a journey. He wrote also Abhanys, some of which reflect very severely on idolatry; and remind the scripture reader of some passages of the old Testament; and the classical student of Horace's delicate satire on Priapus. Some of his lines on the subject were quoted in a former paper. His preceptor, Janardan, was also an author; but of his writings few have come down to posterity.

Sridhar, a learned Brahmin who commented on the Bhagavat, and of the same religious profession, is the next author of eminence that appeared among the Marathas. His most famous works were a life of the Pandavas; a life of Ram; and a life of Krishna; called respectively the Pandava-pratapt, the Ramvijaya, and the Harivijaya. The last mentioned work was finished Sal. Shaka 1493; so that the author must have flourished rather after the middle of the fifteenth century of our era. If Sridhar had any higher object than mere literary fame, he probably intended to propagate the tenets of his sect, and the name of Pandurang, by associating them with the popular legends current among the Hindus. The following description of the

* The author of the Bakti Vijaya, a historical record of the sages formerly mentioned, makes Nama Dnanoba and Kabir cotemporaries; but no dependance can be placed on what he delivers in regard to the date of events that happened long previous to his own time, and the genealogy above referred to, which he has preserved, is a much more certain guide.

God Siva was no doubt intended to throw covert ridicule on him and his worship. It is introduced as spoken by the mothers of Krishna to frighten the infant deity into propriety while puling, because she would not fetch down the moon to him for a plaything. It is as follows :—

पुढति लोलणी घाली घननिल माता म्हणे आलारे बागुल
महा भयासुर विकराळ पांच तोंडें त्यासीं
त्याचे माथां जटाचे भार तृतीय नयनी वैश्वानर
शिरीं झुळ झुळ वाहे नीर भयंकर महा योगी
चंद्रकळा तयाचे शिरीं निळकंट कडांग करीं
भस्म चर्चिलें शरीरीं गजचर्म पांघुरला
नेसलासे व्याघ्रांबर गळा मनुष्य रुंडाचे हार
सर्वांगी वेष्टिले फणीवर दशा भुजा मिरवती
त्यासी देखतांचि छलिजे कां तूं उठोन पळिजे
कृष्णा तूं उगलाचि निजे योगी बाहेर उभा आहे
योगी तो काळाचाहि काळ क्रोधी जैसा वडवानळ
मुष्टी तिन्हेंब्रम्हाडें सकळ धरूनीया रगडिपै

"After this Krishna lay rolling on the floor. His mother then "called out—Holloa! what a terrible mis-shapen fright is that stand-"ing at the door; the monster has got five heads, and a long pigtail "hanging down his back; he has got a third eye, which sends forth "flames, and there is a continual dripping of water from his head. A "fearful ascetic I declare! The moon is glaring on his forehead, and "he has a blue throat; he has parched grain in his hand, and his body "all covered with ashes; he has an elephant's skin for a mantle, and "a tiger's hide wrapped round his loins. The very sight of him is "tormenting! Up Krishna, flee in silence and hide yourself! The "yogi is standing outside red with rage as fire, a very devil of devils; "he seems as if he would cram all the three worlds into his fist, and "make off with them!"

The metre of the above specimen is that in which most of Sridhar's works are composed, and is called the Vovi. It is a loose Trochaic, arranged in stanzas of four lines; of which the three first rhyme with one another, while the fourth does not. Each line has four feet, but the inherent short vowel of the different letters is expressed, or suppressed, just as the verse requires.

The next Pracrit writer of eminence is Tuka Ram; the contemporary of the great Sivaji, and the Kaber of the Marathas. Tuka spares neither Brahmin nor Gosain, but lashes all with his unsparing ridicule. The influence of his works among the middle classes of the community is greater than that of all the Shastras and Purans put together, and his writings have been mainly instrumental in preserving among the Marathas some rational motives on the subject of religion and morality, notwithstanding all the attempts of bigotted Brahmins to render them the passive slaves of an inane and seductive ceremonial. He, however, was the last writer of Abhanys in ridicule of superstition. The Saiva Brahmins under the Peshvas soon monopolized all power and influence, and it did not suit their policy to unsettle people's minds in reference to subjects on a belief in which so many of their caste depended for a livelihood, and therefore future authors were obliged to pursue a different course. The original of the lines in ridicule of the Gosains, a paraphrase of which was formerly given, is as follows:—

आम्ही गोसावी जालों भाई आम्ही टाकिली सर्व काई
पाटिल हो मठी बांधून द्यावी भांग तमाखु पुरवावी
आमची भुंगुत चालवावी येकसीषीन सेवेसी द्यावी
तुका म्हणे ऐसें जोग जैसें सिमग्याचें सोंग

"Brother—we have become a Gosain and abandoned everything,
Patel—build us here a Chapel, bring plenty of bhang and tobacco,
Provide daily food for me, and send a sister to serve me.
Tuka said, that such devotion resembled the mask worn at the Saturnalia."

The justice of these lines will appear evident to every one who remembers that at Puna there is a suburb containing many splendid temples and commodious mansions, all built by the Gosains from the profit of their merchandise; and that it is inhabited by families of their profession, whose only mark of asceticism is the yellow colour of their garments.

Ramdas, the spiritual guide of Sivaji, may be mentioned, also, as a Pracrit author: he composed a dialogue on the Hindu religion, called Das-Bodh, for the instruction of his illustrious pupil. He was born S. Shaka 1530, and died 1603, or A. D. 1681.

Vaman, a writer also belonging to the same era, possesses a good deal of fame as a Pracrit writer: he translated a part of the Bhagavat, and composed other treatises illustrative of the Hindu religion. He

wrote in the Sama Shoka, a sloka constructed according to the common rules applicable to Sanscrit compositions, and also having the two, three, or four last syllables of one line rhyming with an equal number of the preceding.

After Vaman comes Moro-Pant, the most popular of all the Pracrit writers with the Brahmins. Though a Vishnava, he was a Bhagavat, or liberal Vishnava, and wrote poems in honour of other gods, as well as of Vishnu. His verses are generally written in the Arya measure, in which the time of every line is the same ; counting a long syllable two times, and a short syllable one. His works are very voluminous : he wrote in imitation of the Ramayana and Bharata, as well as on miscellaneous subjects. It is said that he was first a clerk, and sat up a whole night to find out an error of two annas (three-pence) which had taken place in the annual accounts of his employer : his master or his wife—for here accounts differ—represented to him, that if a similar intensity of mind were directed towards divine things, he would rise to the highest rank in a future world. From that day he abandoned the world, and devoted himself to religion ; but instead of idling away his time like most who adopt the Vairagya, he employed himself in composing the above mentioned works.

Amrit Rao was a contemporary of Moro-Pant's. Both flourished in the reign of Bolaji Visvanath, usually called Nana Saheb, who founded the Peshva dynasty at Puna in the beginning of the eighteenth century of our era (A. D. 1712). He wrote in what are called Padas, long lines of about 60 syllables, but as I have not seen any of his works, I cannot give any particular description of them.

The same remark is applicable to the works of Ram Joshi of Solapur, who flourished in the reign of the first Baji Rao, a generation later than the preceding author ; and to those of Anand Phandi, who wrote songs and hymns in praise of the second Baji Rao and Bapu Gokla, in the beginning of the present century. There are several other names of considerable note among the Marathas, as Raghunath Pandit, Sadasiva Mamkesvar ; and some poets are alive even at the present time, though none of equal fame with those we have mentioned. Relative to all of these our limits will not permit me to be more particular. The Bhakta Vijaya by Makunda Rao we formerly noticed.

The songs composed in praise of modern heroes, and of the fair sex, I am told, would form a large collection if brought all together,

and vie in the figure hyperbole with similar compositions in any other nation. One which I accidentally saw demonstrated to the satisfaction of the author and his admirers, that nothing could stand before woman; and that not only had great and learned men fallen before her, but even Gods and Rishis. Such compositions are called Lavanya, and form, with other things, an important index to the national mind. All the descriptions given by Ward and other Christian writers of the licentiousness of many Hindu customs and religious rites are flattery compared with the exposures made by these unblushing native painters, who boldly approach subjects and ideas from which the mind of a European instinctively turns away, and which, indeed, could not be expressed in our language. I am fully aware of the imperfection of this sketch of Pracrit literature. If, however, I should be instrumental in paving the way to future inquirers, my great end will have been gained. I should wish to see the attention of learned natives directed to a selection of some of the best of the pieces abovementioned, for the purpose of having two or three volumes accurately printed, with an index of difficult words for the sake of beginners. The study of these authors would improve the style of Maratha composition, which is in danger at present, from an almost exclusive attention to foreign literature. To a learned native the English is needful to open up to him a storehouse of ideas; but the Pracrit must be studied in order that he may be able to diffuse beneficially among his countrymen the knowledge he has acquired.

II.—*Dr. Nicholson on the Island of Perim.*

Dr. Nicholson, Civil Surgeon at Surat, having permitted the following valuable paper on the Island of Perim to be published in the Journal of the Bombay Branch of the Royal Asiatic Society, it will be useful to insert all the information yet before the public on this most interesting subject. This information is as yet very scanty, but when it is known that it is so, there is no reason to fear that this rich field of research will be much longer neglected. The interest excited in all parts of the civilized world by the recent discoveries in the fossil remains of the Sub-Himalayan regions, give an additional importance to the history of those found in our own neighbourhood, and a strong inducement to spare no pains to identify and describe the fossils, and to compare them with those illustrated in so admirable a

manner by Dr. Falconer and Captain Cautly, and Lieuts. Baker and Durand in Bengal, and by Dr. Buckland and Mr. Clift in England.

In anticipation of the importance to Science which these remains are likely to attain when better known, it may be worth while to mention the dates of the various communications on this subject that have appeared. The first discovery of fossil bones in North Western India was made by Dr. C. Lush, of the Bombay Army, and is noticed in a paper entitled "Geological Notes on the Northern Conkan and a small portion of Guzerat and Kattywar," published in the Journal of the Asiatic Society of Bengal, No. 60, December 1836. This paper was received by the Bombay Medical and Physical Society in May of the same year, and was communicated to the Calcutta Journal on the 17th August following, in a letter from Dr. Morehead, the Secretary, to Mr. James Prinsep, the conclusion of which is as follows:—"I am "further directed by the Committee to request, that in the event of "Dr. Lush's paper not being adapted for the pages of your Journal, "you will be kind enough to return it to me, that the Committee "may adopt other measures for giving publicity to the interesting "facts which it contains, and the merit of the discovery of which "rests solely with Dr. Lush." The part of Dr. Lush's paper in which he announced this discovery, together with Baron Hugel's note (who, it will be observed, did not visit the Island,) and Mr. Fulljames' interesting paper, both published in the Journal of the Asiatic Society of Bengal for June 1836, constitute the whole of the information we possess on Perim. Baron Hugel also forwarded a communication (now first published) to the Secretary to the Bombay Asiatic Society in June 1836, together with a collection of specimens. The specimens are not of great value, but the collection will soon be increased by other contributions. Valuable collections have already been presented to the Calcutta Museum, and sent to Europe, by Baron Hugel, Mr. Fulljames, and others, and a few are in possession of the Geographical Society and of private individuals here.

JOHN G. MALCOLMSON.

Extract from Dr. Lush's paper on the Geology of the Northern Conkan.—Journal of the Asiatic Society of Bengal, December, 1836, *pages* 768, 769.

"The next point at which I found conglomerate rock was at Gogo in Kattywar, where masses of rock containing shells are dug out from

the beach, the upper portions having been carried away by the encroachments of the sea. This information will, I hope, be soon traced up by the South Eastern to the Western coast of Kattywar. I before observed that the rocks at Baunagar are trap. Now these conglomerates appear to contain fragments of a great variety of mountain rocks, always excepting trap. This circumstance affords suspicion that the trap was thrown up subsequently to the deposit of the conglomerates. I say merely suspicion, as I know of no evidence of upheaving, nor the nature of the strata at the points of junction. Those between Gogo and Baunagar are either obliterated by extensive degradation, or concealed by deposits of mud.

"The island of Perim, in the Gulf of Cambay, afforded me a better opportunity of examining the conglomerate than the denuded beach of Gogo.

"Perim is about three miles in circumference. About half the island, proceeding round the Western side towards the Southernmost point, consists of strata of conglomerate rock, much acted upon, but forming cliffs in several parts to a height of about 30 feet above the sea, the upper strata being of compact sandstone,—all perfectly horizontal. The conglomerate contains shells and other fossils, some undoubted bones, &c., which have been forwarded for identification to Calcutta.

"Fine sand, partly from the decomposition of these rocks, but chiefly, perhaps, thrown up by the tides from the opposite coast, appears to have been blown by the South-west monsoon so as to form dunes of very singular aspect, mostly rounded at the top. In one place a sand-hill has a quadrangular platform-like summit. These sand-mounts seem to have formed a barrier to the farther encroachments of the sea. There is a valley to the Eastern side of the island, partly in turf, and some part cultivated open to the sea, where one may walk with a firm footing, while the sandy dunes of the higher level give way in every direction."

"Proceeding from the south point towards the Eastward (the open valley), layers of Kankar are met with below the sandstone: beyond this is a low cliff of sand,—the valley completing the circuit.

"In the hope that some of our members stationed in Guzerat will carry on the investigation of the fossils, not only of Perim, but of other parts of the formation in Kattywar, I have hastened to lay before them this imperfect sketch, without waiting for a report on the

nature of the fossils found, or presuming myself to offer any opinion, or to draw a conclusion on that part of the subject."

"*Discovery of Fossil Bones in Perim Island in the Cambay Gulph.*" *(Reprinted from the Journal of the Calcutta Asiatic Society, May* 1836.)

"The following notice of the interesting discovery of this new deposit of fossil bones has been obligingly communicated to me in a letter from the Baron Hugel, dated at Bombay, the 17th April. Although its publication anticipates the arrival of the specimens themselves, it would be an injustice to Science and to Dr. Lush to delay for a moment so important an announcement. The acknowledgements of the Society are due, both to the discoverer, and to the Baron Hugel, for the preference given to our museum for their preservation. I hope the circumstance may lead to fresh exertions in the valley of the Nurbudda, where doubtless much still remains to be explored.—J. PRINSEP, *Secretary.*

"You will receive shortly a few fossil bones from Perim Island in the Cambay Gulph. Dr. Lush has the merit to have found them, but without exploring them at all. I had no time to go over from Surat where Dr. Lush showed me them. I requested him to send them to you through Mr. Wathen. One is an imperfect bone of a mastodon or elephant, another the head of a boar unknown, and one belonging, I think, to a '*Rongeur*'; but what induces me particularly to wish them at Calcutta, is, that there is a horn in its matrix, which, connected as these fossils must necessarily be with those of the Nurbudda, might belong to that species of Bos mentioned in your Journal: it is decidedly not of a Buffalo. I was so anxious to reach Bombay that I could not possibly go to Perim myself. I did however manage to send a boat over, and I received yesterday 41 pieces of fossil bones: the greater part belonging to the Mastodon latidens, of which the teeth in a perfect state did not leave any doubt; some of the bones are of an immense size, one fractured piece of the tusk measuring from the centre to the outside of the circle 5¼, which gives 10½ inches diameter, or 34 inches in circumference: some of them are in the same hard matrix you will see imbedding the horn; some evidently rolled by the sea. There are some curious teeth among the fragments I possess, and two triangular shaped pieces similar to the horn of a rhinoceros: the teeth are however too large to belong to

that animal ; I may perhaps send the most curious specimens round to you ; but I am at this moment too much pleased with my discovery to part with them. It appears that the island abounds with fossils, and it is a clear proof either that the Nurbudda must have found only lately its way to the Cambay Gulph, or that some other revolution must have separated that little Island from Kattywar. Having no opportunity to leave this for either Persia or the Cape, I may still perhaps be able to go to Perim and Gogo, to trace the fossils on the main land of the Peninsula." "HUGEL."

"Since the above was set in type, and just before striking off the sheet, I have been favoured with the subjoined information from a new correspondent, Lieut. Fulljames, which I hasten to make known through this Journal, while I venture to assure him of the thanks of the Society for his projected exertions to enrich its Museum. Who will not become an enthusiast amid such discoveries? It is but four years since the existence of strata containing fossil bones was denied in India, or at least supposed to be confined to Assam and Ava. We are proud to think that this Journal has been in some measure the humble means of stimulating the search which has been thus crowned with success in so many quarters.—ED.

"On my arrival in this part of the country in the month of April, I heard a report that some bones turned into stones, as the natives called them, had been discovered on the Island of Perim in the Gulph of Cambay, and in latitude 21° 39′.

"I lost no time in going there to see if the report of fossil remains was correct, and although I do not pretend to be a geologist or know much about fossil osteology, still I consider my labours most amply repaid, by my first visit to the Island, for I obtained a most perfect specimen of the teeth of the mastodon ; one also that I think belongs to the palaeotheruim ; and the femur, vertebræ and many other bones belonging to mammiferous animals now extinct.

"Being well aware from the perusal of your scientific Journal, how highly, and I might say justly, remains of this sort are prized, I shall take the liberty of forwarding to the Society for their acceptance a box containing specimens of these fossil remains.

"The formation in which they were discovered is a tertiary conglomerate, composed of nodules of sand-stone, indurated clay and a small proportion of silex cemented together by a yellow clay ; most of the fossil remains have been exposed to view, by the sea having washed

off the upper part of the matrix, but still they are firmly attached to the rock, and the only way they were to be obtained, without breaking, was by stone-cutters carefully working all round them ; large quantities of petrified wood were lying about in every direction.

" The following is a list of the strata as they appeared to me, commencing from the surface, viz.

1st.—Loose sand and earth.

2nd.—Conglomerate, composed of sandstone, clay and silex.

3rd.—Yellow and whitish clay, with nodules of sandstone.

4th.—Conglomerate as before.

5th.—Siliceous sandstone with a few fossils. (Calcareous—Ed.)

6th.—Conglomerate.

7th.—Indurated clay more or less compact.

8th.—Conglomerate, in which the best, and I may say, nearly the whole of the fossil remains have been discovered.

" The deepest strata of conglomerate are about 3 feet, but they generally do not run more than 18 inches to 2 feet, and for the most part lie horizontal. On the Western side of the island however, the strata are much disturbed, being fractured, and dipping at an acute angle to the East ; on the Southern end of the island sandstone appears below the fossil stratum of conglomerate, dipping to the North at an angle of 25 degrees.

" There is a tradition among the inhabitants of Gogo, that the island of Perim was formerly joined to the main land by means of a stone bridge, which has, in the course of time, been destroyed ; remains of some buildings are still to be seen, running into the sea in the shape of piers, &c. It must have been a very stupendous undertaking, for there is a channel now between the land and the island, of the depth of 75 fathoms and nearly 500 yards in width.*

" On the island there are the remains of a considerable fort, and buildings of Hindoo architecture, for I observed in an old temple that had tumbled down, the broken figure of Budha rudely sculptured in a sitting posture ; also the remains of a large tank, wall and *bauli*. Among the other curiosities of the island are two elephants cut out in the rock ; they are covered now by the sea except at very low water ; one is finished, and I should say, measured about 10 feet long by 8 or 9 feet high. Capital fresh water is procurable on the island, 20 feet below the surface ; it is found below the stratum of sandstone.

* See Extract from Mr. Lumsden's letter, page 25.

"I will here enumerate the varieties of specimens of fossil remains, which I think have been found :—Teeth of mammoth ; ditto mastodon, palæotheruim, hippopotamus or rhinoceros, and a number of other smaller animals. The head of some large saurian animal ; part of a tortoise ; ditto of elephant's tusks. Femurs ; vertebræ ; and other large bones ; one shell in siliceous sandstone, and the half of a deer's foot. With this vast variety before me, it requires a person much better qualified than myself in the art to say to what particular animals the different specimens belong, and I therefore forward them with the hopes of hearing the opinion of the scientific in Calcutta.

"It has occurred to me, on reading over the Journal for August 1834, that the conglomerate in which the fossil remains in the valley of the Nurbudda have been discovered, is very nearly similar to that in which the Perim fossils are found ; and if my conjectures are correct, we shall be able to trace the formation along the whole line of the Nurbudda valley, and the greater part of the Kattywar coast. Should such be the case, and I have but little doubt in my own mind that it will be so, what a vast field has thus been thrown open for discovery and research ; I still hope to see my conjectures fulfilled with regard to finding Coal in the Rajpipla or Kattywar ranges of hills before the lapse of many years.

"Not wishing to take the credit to myself of having been the first person to discover these remains, I should mention that I believe Dr. Lush was the first ; he having, I understand, found a tusk of some animal on the Island.

"During a second visit to the Island, I was accompanied by three other gentlemen, who have most kindly given me permission to forward any part of the specimens so obtained, that I think may be acceptable.

"Doubtless on further research and on breaking up the stratum, more perfect specimens of bones will be discovered ; for I must mention that all those sent were covered at high water, the highest point of the island not being above 60 feet higher than high water mark : the length of the island is about 1½ miles to 2 miles, and in breadth ½ to ¾ mile ; large sand hills are formed on the South-west side, and it is inhabitated by about 12 houses of coolies, who cultivate bajri there during the monsoon. A light-house has been established there for some years, and kept up by the Government, of which a serang and five lascars have charge ; the expenses are defrayed by levying a duty on all boats passing.

"Should I be able to make any further discoveries, either in fossil remains or as to the formation of the Kattywar hills, I shall trouble you with a further communication; that is to say, should you consider the present worthy of occupying any part of the pages of your interesting Journal.

"GEORGE FULLJAMES."

Extract from a letter from Baron Hugel, to the Secretary to the Bombay Asiatic Society, dated 5th June 1836.

"I received the other day from Mr. Williams, Political Commissioner for Guzerat, a collection of fossil bones from Perim Island, from which place I requested his having the kindness to procure me some, as I was at Surat with him, when Dr. Lush brought from thence a few specimens of petrified bones. The collection he sent me consisted of 44 pieces, and as I think that the Asiatic Society at Bombay would not object to give a little place to some of them, as the highly interesting fact of the mass of fossil remains in that little Island is worth a closer investigation, I take the liberty of sending 25 pieces to you. I think that when placed in the rooms they will most likely induce travellers in that direction to collect more of them. I have numbered them and made a little description of them, which is however a very superficial one:—the immense quantities of fossil remains found lately in different places in India would make it very desirable that a gentleman at Bombay would take up this highly interesting study; many extinct and entirely new genera of quadrupeds have been discovered, some of which have not even left a representative existing in the world in a living state. I am confident that great discoveries could be made at Perim, which, as a little Island *(now)*, offers a highly interesting fact in the possession of these fossils: I anticipate that they will be found in Kattywar too, and the Island may have been formed either by an earthquake or by a separation from the main land through a rush of water.

"I am sorry that my time then did not allow me to inspect the Island myself, and I regret that even now I am obliged to break off without being able to enter more fully on the subject.

"Believe me, my dear Sir, with my best wishes for your health and happiness in this part of the world,

"Yours very truly,

5th June 1836. "HUGEL."

List of Fossil bones from Perim Island in the Gulph of Cambay :

1, 2, 3, 4 and 5, Pieces of the Tusks of Mastodon (Gigas Elephas lati-dens) : having found too the teeth of the animal on the same spot, there can be no doubt of the animal. Those pieces must have been a long time exposed to the tide and ebb, as they are partly perforated by a kind of serpula.

6.—Bone of the foreleg (the lower joint) of Mastodon gigas.

7.—Fragment of the bone of the leg of the same animal.

8.—Fragment of the shoulder blade bone of the same.

9.—Vertebræ of ditto ? (N. B. at all events of a smaller individual.)

10.—Fragments of the scull of the same.

11-14.—Shapeless fragments.

15.—A very singular formed fragment like petrified wood.

16.—Shapeless bone with a singular shining substance on it : in the matrix is contained a black substance like Umbra.

17.—Here a fragment of a petrified tusk is a second time petrified : the calcareous fossil is surrounded by a hard sandstone.

18, 19, 20 } Most likely fragments of bones of Mastodon, the matrix singularly marked and perforated by the above mentioned serpula.

21, 22, 23, 24 } Pieces of a large ruminant. I think the bones easily referred to this genus through comparative anatomy (Bos, I think).

25.—Pieces of the horn of a stag (Cervus).

My own collection contains fragments of Rhinoceros, and larger fragments of Stag (Cervus), and of the horn bone of Bos.

This gives till now only four kinds of animals : two Ruminants and two Pachydarmita. One jaw with teeth in my possession is new to me."

A Description of the Island of Perim,
With a few Remarks on its Geological Formation. By Dr. Nicholson, Bombay Establishment.

This Island lies at the Western side of the Gulph of Cambay, at the distance of about 2½ miles from the coast of Kattywar, in 21·35 of North Latitude, and 72·26 of East Longitude. It extends in length from North-West to South-East about one mile and a half, and the greatest breadth is short of a quarter of a mile.

The greatest part of it is covered with hillocks of sand, as will be seen by a reference to the plan of its surface (No. 1) ; leaving in the centre and extending to the Eastern side, only a few acres of light cultivable soil, consisting of a mixture of vegetable earth and sea sand; and I think there is little doubt, but this patch of soil on which the natives grow a little Badjree during the monsoon, in the course of a few years more will be entirely overwhelmed in the continually encroaching sea of sand.

The sand hills are from 10 to 50 feet in height (forming a sort of amphitheatre inclosing on all sides but the East the few acres of cultivated lands) ; they are blown up in long undulated ridges in a direction from West to East, and in consequence of owing their elevation to the prevalence of strong Westerly winds, they are steeper at the Eastern extremity than to windward :—the ridges are separated by little windroads or valleys, sometimes reaching right through the sand ; but in general sloping up gradually towards the East, and, like the hillocks, terminate abruptly.

The tops of the hills are covered with the species of asclepias common to sand tracts in other parts of India, which, together with a few neem trees, whose flattened tops serve the natives as store houses for their straw, one or two goond trees and some bear bushes, and a group of mangroves on the Eastern shore, compose the list of Perim's trees.

Pea-fowl wander among the hills, living chiefly on the berries of the asclepias ; there are also some bastard florikan, with the common shore birds.

On the Western side of the Island stands the light house, from the top of which the plans accompanying these notes were taken ; at the foot is a small Bungalow for the accommodation of visitors : both are situated on the South-West corner of a ruined fort, the remains of which extend right across the Island ; in the middle of this, on a sand hill, stands the village of Perim, consisting of about a dozen huts, built on the edge of a large square built tank, now nearly filled up with drifted sand. The Fort (of which the West face and gateway to the height of several feet are still standing, and the ruins on the East side are quite discernible) has had the largest half of its space from the West side buried deep in the sand hills. That there must have been some accumulation of sand on the Western side at the time this Fort was erected is quite evident, as, for the purpose of strengthening the walls, stone slabs set on edge and ten or twelve feet long, are in-

serted, at every five or six feet, into the wall at one end, while the other is buried in the sand ridge inside. The places where these stones have been cut out are visible all over the shore, and the stones consist of the conglomerate or breccia containing the fossil remains found here: there are also two monolith elephants (one of them in ruins, the other standing) on the beach, cut out of a stratum of the same breccia, which were probably meant to ornament the gateway of the fort; at least the natives have a tradition attributing these as well as the other works of former days on the Island to a common origin. They say that Makra Goil, a giant of the Kattywar tribe, or family of Goil, fled hither on some disturbance taking place in that country, towards the end of the thirteenth century, that he erected the Fort just mentioned, and was afterwards slain by Tohgruck Shah, king of Delhi, and was canonized by his countrymen;* who, in order to prove that he really was a giant, point out his Tomb at Gogo above 17 feet long, in the form of a common Mussulman grave; but unfortunately for the credit of their tale they forgot that the giant would in all probability be a little more corpulent than an ordinary sized man, for which only they allowed in the breadth of the tomb.

From the light house, Luckagam Lohara, on the point of the North bank of the Nurbudda, bears E. N. E. distant about fourteen miles.

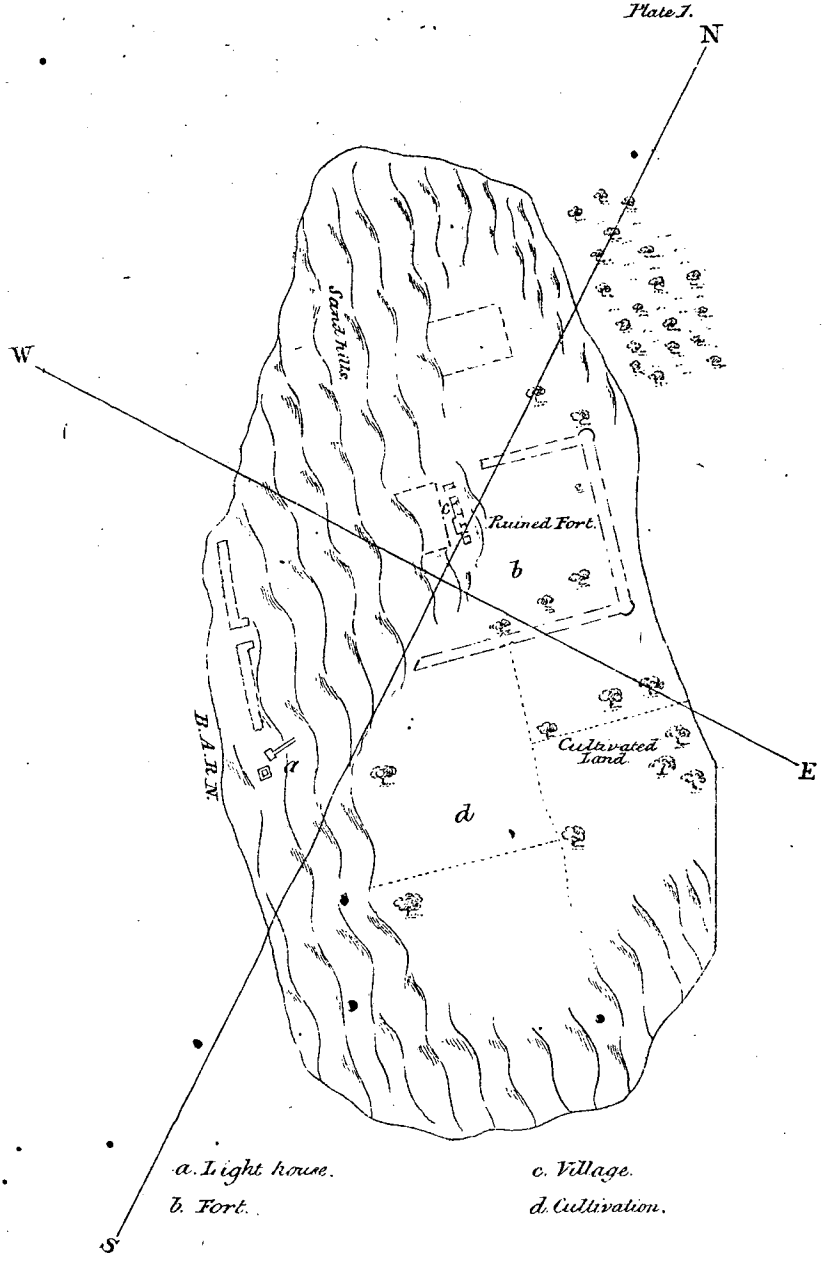
Gogo in Kuttiawar N. W. by N., distant about 8 miles.

The South Western point of Kuttiawar S. W. by S.

This Island consists of alternate strata of recent sand-stone and conglomerate or breccia, as shewn at the Southern extremity of it, which ends in a cliff made by the action of the sea, with its ruins forming a sort of talus at the foot of it. The upper strata are very pliable, and consist merely of compact sand with thin layers of hardish sand-stone imbedded (see plan 2nd). By looking at the low water plan of the Island (No. 3rd), it will be seen that at the ebb tide a narrow slip of shore is uncovered at the Northern extremity, from which gradually increasing in breadth it extends on each side and expands in a pyriform manner at the Southern end, where the shore left by the tide extends about half a mile from the land. If a line be drawn South West from the light house, and another due East across the shores, the space included on the South sides of these lines is that occupied by the alternate strata of conglomerate, best denominated ossiferous breccia and sand-stone, and in this formation are found the nume-

* See extract from Mr. Lumsden's letter, page 25.

Plate I.



a. Light house.
b. Fort.
c. Village.
d. Cultivation.

a. b. c Breccia.

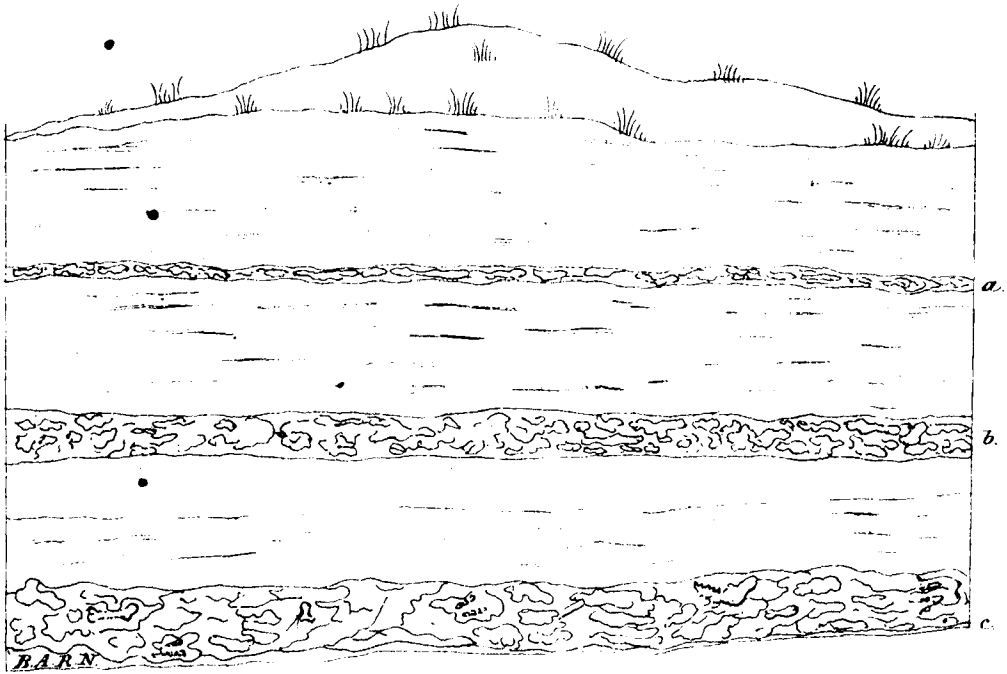


Plate 3.

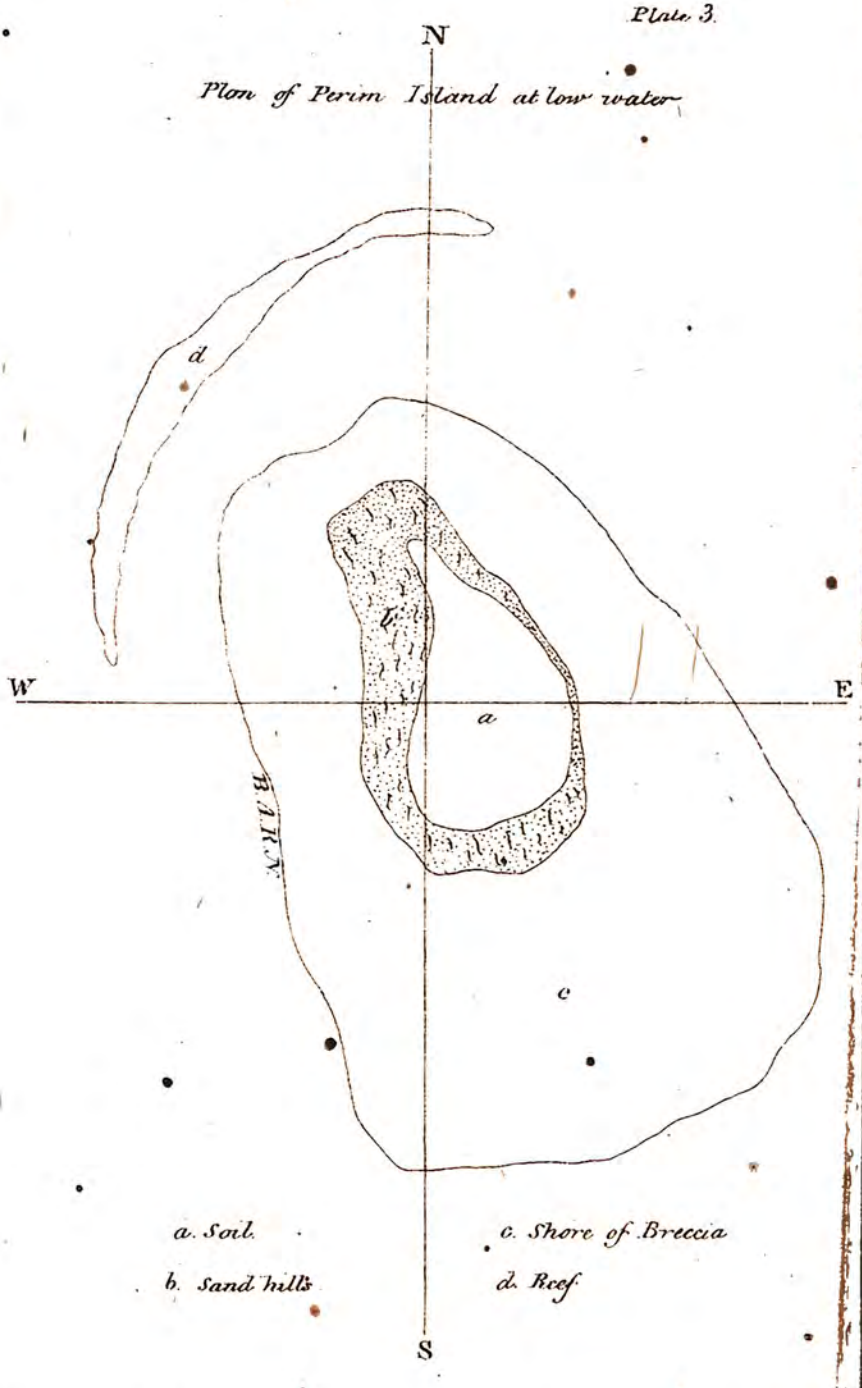
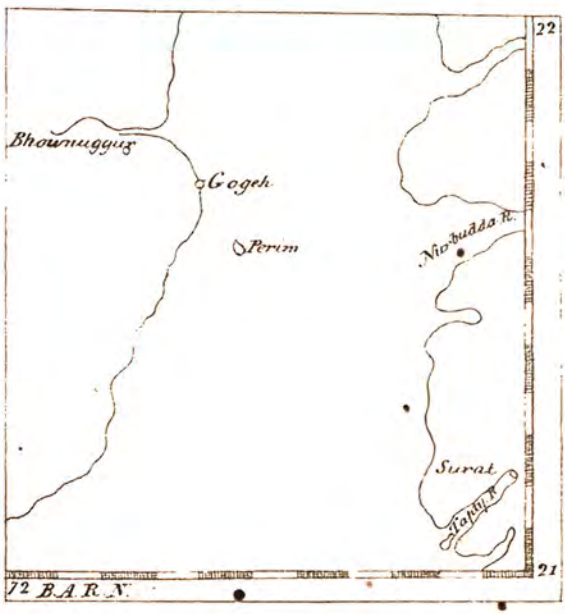

Plan of Perim Island at low water
N
W
E
S
d
b
a
BARR
c
a. Soil.
b. Sand hills
c. Shore of Breccia
d. Reef

Plate 4.


22
Bhounuggur
Gogeh
Perim
Nerbudda R.
Surat
Tapty R.
21
72 BARN.

rous fossils of terrestrial animals, which have of late directed attention to this litte Island ; and as the matrix is much softer and more yielding than the included fossils, the latter are gradually denuded by the action of the sea, and are easily discovered by their glossy black surface, in contrast with the brown calcareous earth in which they are embedded. This matrix contains besides numerous spheroids of compact sand stone (varying in size from that of a pea to that of a large orange), few angular fragments and numerous teeth of various animals. I have only discovered one oyster shell, and no human bones.

Mr. Lumsden kindly allowed me to have possession, for some time, of a large collection of these fossils, and in all probability the largest collection that can ever be made at one time, as it is the harvest of the great length of time that must have elapsed, while the sea slowly released these fossils from the stony bed in which they had been inclosed ages before ; during which three strata of the same breccia (superincumbent) have been entirely washed away, as well as several of the sand stone already described.

The fossils just mentioned were found on the surface of the rocks quite black and polished by friction, having none of the calcareous earth adhering to them, when attention was first drawn to these curious products of the Islet. Now they must be assiduously sought for, and then quarried out of a tolerably hard rock. In the collection there were the skull and upper jaws of a Mammoth (Elephas primigenius), or Mostodon ; the lower jaws apparently of the Hippopotamus, the entire skull of a species of deer or antelope ; a fresh water turtle, and many enormous teeth, and other bones.

The surface of the ossiferous rock is every where broken into large holes, as if the subjacent stratum had been wasted away beneath and the rock fallen in, and in these hollows the fossils are often found.

We might form a tolerably correct estimate of the degree of waste to which this breccia is subject in a given time, could we place any reliance on the tradition which assigns the origin of the two monolith elephants on the shore to the before mentioned Makra Goil ; one of them has been broken to pieces, either by the hand of man in search of treasure or by the violence of the sea in the course of its everlasting work of destruction, but the other still stands, nearly perfect, and but little corroded: it appears to be in the act of kneeling on the body of a man.

On the Eastern and South-Eastern part of the shore, are also

found large masses of petrified wood, all of which appear to have been rolled and transported hither from a distance; yet this worn appearance might result from the disinterring operation of the sea in the same manner as with the fossil bones, but I could discover none of it imbedded in the rock.

It may be as well to remark here, that during each monsoon immense quantities of drift wood, as well as numbers of human and other bodies, are cast ashore on the Island; and are often partially or entirely buried in the sand and mud by the agent which landed them, and are then swept off again; many of them in all probability to add to new deposits of a similar nature to that just described, which doubtless are in continual progress of formation—nor is it at all improbable that hereafter, human remains may be found in these new deposits, mingled with the fossil remains of species long since past away from the living ranks of nature. I am led to this remark, because at present the fossils after being relieved from their bed of breccia are washed off the rocks together with recent organic and inorganic matter of all descriptions, and perhaps in this way we may account for the apparent anomaly, when, though rarely, the bones and exuviæ of extinct species are found promiscuously with recent ones in formations considered as subsequent to this disappearance of the former.

I have met with a breccia very similar to that of Perim in a very distant part of the world, but differing materially from that in the quantity of bones contained in it, so as to constitute it a real bone breccia. While making the tour of *Sicily* in 1836, my friend Mr. Goodwin, of Palermo, British Consul General in that Island, directed my attention to the cave of Santo Ciro under Monte Grifone, in which the bone breccia is deposited; and as it is in some measure connected with our subject, I shall quote the opinion of Dr. T. Christie on the formations in this cavern, and on those of Syracuse:—"There can be no doubt that the extinct quadrupeds existed at a period long posterior to that in which the Mediterranean began to be inhabited by its present species of mollusks, radiata and zoophytes; and before the last great convulsion, which raised a great part of Sicily above the level of the sea, the smooth water-worn surface of the cave of Santo Ciro, and of some of those at Syracuse, and the numerous holes left by perforating marine mollusks (lithodomi), force upon us the conclusion that these caves were long under the surface of the sea, and that

at a period long posterior to the formation of the lime-stone beds containing shells of existing species, for we find these beds at Santo Ciro below the bone breccia, and at Syracuse they actually form the cliffs in which these caves are situated; not only however were these caves long under the sea, but they continued so for a great length of time after the bone breccia had been deposited in them,—of which we have ample evidence both in the cave of Santo Ciro and in those of Syracuse. In the former we find distinct traces of stratification in the breccia, and above it is a thick bed of clay containing a few bones which could only have been deposited by tranquil water. In the breccia of the latter, we have still more positive proofs, for in it we find sea shells, and its surface has been worn down by the waves and has been perforated by marine animals, and since that period these caves have been all raised up above the level of the sea into their present positions."

The cave of Santo Ciro (which I frequently visited) is situated about two miles to the South East of the City of Palermo in the scarped Northern face of Monte Grifone, and immediately above the monastery from which it borrows its name, about 180 feet above the level of the sea, which is now distant nearly two miles on the North; and it does not appear that the relative situation of sea and land have been perceptibly altered, within the period of authentic history, although the natives have a legend that the sea or rather a fresh water lake, in ancient times, covered nearly all the interjacent flat between the cave and the sea which now forms part of the plain of Palermo. This lake called Movdolced, much reduced in size, still occupies a large space, but is gradually being filled up by a vegetable moss or bog like growth, and becoming dry land.

As I believe that hitherto no attempt at an explanation of the formation at Perim has been made, and having formed some conjectures on the subject I do not think it can be productive of any harm to state them, nor however erroneous these views may hereafter prove to be, can they be detrimental to the researches of others more conversant with the science of Geology and therefore more competent to describe.

By looking at the Chart No. 4, it will be observed that Perim is nearly opposite to the mouth of a very large river, the Nurbudda; to this river in particular, together with the other streams emptying themselves into the Gulph of Cambay, I am inclined to attribute these deposits of ossiferous breccia.

As it is probable that the mainland of India, in common with other parts of the world, prior to the existence of man, was inhabited by many species of animals now no longer existing; and as the extensive alluvial deposits found on each side of the Nurbudda and other rivers prove to us that the country through which they flow must in the course of ages have had its surface considerably raised by the agency of these waters alone independent of any other cause, we may imagine that the floods that occurred in remote times, were, from the extent of surface they then covered, and the greater rapidity of their currents from the greater declivity of their courses, of a much more destructive nature than they are at present, and would therefore bring down occasionally large quantities of the materials necessary for forming the breccia of Perim, and which they would discharge into the Gulph of Cambay, then of course much deeper. Thus one stratum of breccia would be formed after a great storm or inundation, and in the interim between the subsidence of this and the occurrence of another stratum of muddy sand forming the stone which alternates with the breccia, would be thrown down.

There are at present three strata of breccia having beds of sand stone between them, and increasing in thickness the lower they lie in the cliff, at the Southern extremity of the island, and a fourth cropping out, on the shore from beneath white sandstone, much exceeding any of the higher ones in thickness and spreading over a large extent of shore. It is out of this layer that the two elephants' figures on the shore have been cut, and they are above five feet thick; while the uppermost layer of breccia is not above three inches thick and gradually gets thinner till it disappears towards the West. Taking it for a moment for granted that my theory of their origin is correct, the difference in the size of the strata is easily accounted for in this manner:— when there was a greater depth of water, a large quantity of matter would be borne along and the deposits be less.

In our own era many destructive floods have occurred in different parts of the world somewhat calculated to corroborate the idea here advanced, such as that in Java, mentioned by Raffles in 1699 and another 1821; that in Scotland in 1829; and those which occasionally occur in all countries, the rivers of which are periodically liable to floods.

The breccia being formed, in order to cause Perim to emerge from the bosom of the sea, and thus display the works that have been car-

ried on in her depths, we need only have recourse to the agency of some internal convulsion of the earth by which so many parts of the world have been heaved up, and some even in our own time; and perhaps some traces of such a convulsion may be recognised in the shape of a deep fosse or canal extending midway up the channel between Perim and Kattywar past Gogo to the mouth of the Baunagar river. In this canal the water is from thirty to forty fathoms deep, though on each side of it the depth is only twelve fathoms, which is the general depth of the Gulph of Cam bay.

I regret that there was no opportunity for me to examine the shores on each side of the Gulph, but several masses of conglomerate, something like that of Perim, were lying about at Gogo.

I have never heard of strata of ossiferous breccia having been noticed in any part of the world, alternating so regularly with other strata as those of Perim; and I have no doubt that many and valuable facts might be elicited from a scientific examination of this Island, particularly with regard to extinct races of animals,—the remains of which might be found to predominate in the lower strata, and gradually giving place to more recent species in the middle strata till they disappear altogether in the highest. A discovery of this nature on one spot would certainly tend to throw considerable light upon the history of these animals which have ceased to exist in the world, and thus add an important step to that branch of Geological Science.

Of course a discovery of this kind can only be looked for, if it should be found that the breccia has been deposited in the different strata at long intervals of time.

At the bottom of the hill on which the light-house stands, there is a well, to examine which I eagerly hastened, under the idea that, being sunk through the rock, it would afford a view to some depth of the structure of the island, but its interior was sheathed in masonry.

Extract from a letter dated Surat, January 4th, 1841, from J. Grant Lumsden, Esqr., Bombay Civil Service.

"The island of Perim is on the Katiawar side of the Gulf of Cambay, distant from the main land about 3 to 3½ miles, and from the port of Gogo about 7. Lieutenant R. Ethersey's recent survey and chart of the Gulf, makes the latitude of the light-house on this island 21° 35′ 22″. I had no means of ascertaining the exact longitude, but a map of Cary places it in 72·26 E. The island itself lies in a N. W. by

N. by E., S. E. by S. direction. It is about six miles in circumference; in length rather more than two and a half, in a right line between the two extreme points, exclusive of the reefs. A great part of the Island is covered by a continuous range of Sand Hills, resting on a scanty bed of black soil. While these hillocks appear to form a barrier against the sea along the whole of its Western face, and are continually encroaching on that side from the drift occasioned by the prevalent winds in the fair season, the eastern side of the Island is comparatively free from sand, and its soil affords a scanty subsistence to villagers who visit it from the neighbouring main land at the conclusion of every monsoon, and reside there until the approach of the next rainy season. When I visited the Island, I found no traces of cultivation, as not a single shower of rain had fallen during the monsoon of 1840. Peafowl are found among the low brushwood on the sand hills. I took the following bearings from the light-house.

The port of Gogo in Katiawar bore N. W. half N., distant about 7 miles.

The extreme western point of the coast of Katiawar, visible on a clear day, bore S. W. by south.

Luckee-gaom Loharra, or the Northern head-land of the Broach river on the Eastern shore of the Gulf, bore E. N. E. Whilst anchored in 9 fathoms clear of the bar at the entrance of this river (the Nurbudda,) the ebb spring tide during its greatest velocity ran past, as well as I could judge, about five miles an hour.

I mention these bearings, because I have heard it supposed that the fossil remains of Perim, which have only been discovered on the Island in one direction, had originally been carried out to sea by the stream of the Broach or other rivers, and left by the force of the tide upon the strata in which they are now found imbedded. I believe that these strata are what are called conglomerates, resting on a coarse sand stone, which forms the basis of the Island, and of the neighbouring reefs. The reefs in question are composed entirely of this conglomerate, and being very flat, are laid bare by the receding spring tides to a considerable distance, especially in a direction South, and S. by E. from the light-house. In this latter direction they extend seaward for at least two miles, from the base of a low bluff in which the Island itself here terminates. It is upon this part of the reef, which also sweeps round the Island in a South West direction, that the fossils are discovered, and as yet upon no other. Here too, fossilwood

is found in great quantities, as well as animal remains. The bluff above mentioned exposes distinct horizontal strata of conglomerate, supporting the black soil of the Island, and lying over beds of sand stone. At its foot are detached masses of both of these rocks mingled indiscriminately. It is said (by the serang) that the reefs are continually encroaching on the Island at this point, not from the violence of the spring tides which cover it at intervals, but by the action of the heavy rains during a favorable monsoon, by cutting through the bluff and detaching masses of the conglomerate and sand stone, which are afterwards removed by the tide. Here and there on the reef itself, shelving masses of sand stone appear to have forced their way from beneath the superincumbent platform of that composition of which the reef is composed, and which I have called conglomerate. This appearance is found to occur chiefly in the immediate proximity of the Island. One of the specimens which I have sent, and which will be easily distinguished, conveys a very fair idea of the appearance of the fossils as they are found lying upon this reef; some of them have a high natural polish, others appear as if corroded by long exposure, and partially destroyed by the force of running water. It would appear, that to the same power we owe their slow exhumation, as they are occasionally discovered entirely embedded in the rock. But if this is the fact, I shall presently give some reasons, when I allude to certain legends related of this Island and its former masters, to prove how slowly this process of the wear and tear of the sea must be carried on.

The first legend to which I shall allude relates, that Perim was formerly joined to the neighbouring Coast of Katiawar. This belief, which is a very prevalent one among the maritime population in the neighbourhood, and may have originated in the existence of numerous and very intricate reefs which the ebb of the tide discloses between Perim and the main, especially in the direction of the port of Gogo. But the Serang in charge of the Light on Perim gave me information, which it may be useful to repeat in connection with this legend. The nearest part of the Katiawar coast lies about due West from the light-house, leaving a channel between three and four miles in width. This channel on either side is shallow, the water never beyond eleven fathoms over a rocky bottom, every where rising into reefs and ridges, which exhibit the same formation as the Perim flat reefs already described. Towards the centre of the channel, however, the soundings

deepen suddenly to 35 fathoms, with a *bottom of stiff yellow clay.* Through this extraordinary pit or nulla at the bottom of the channel, the tide runs with very great velocity. This depth of water equals what is found in any part of the Gulf of Cambay, between the coasts of Katiawar and of Goozerat. It shoals abruptly, I was informed, at either extremity of the pit or nulla to 14 fathoms, one extremity (as pointed out to me by the Serang) bearing from W. by S. to W. S. W. from the light-house, the other about W. N. W. From the latter a channel is traced by soundings, which passing by Gogo, leads to the entrance of Bhownuggur river, about 19 miles* to the northward of Perim, and which is well known to the Perim men, and to the fishermen and mariners navigating the Gogo coasting craft, by the name of the former river. It even bears that name to the spot where, as indicated by the soundings, it terminates in the abrupt descent of the pit or nulla which I have attempted to describe. It is right to add, that this information rests exclusively on the authority of the Serang in charge of the Perim light; but he is a sharp and clever man, well acquainted with the depths of the water in the Gulf, and not very likely to be in error.

The second legend might lead one to surmise that some alteration had taken place in the level of the reefs of Perim Island, since the end of the 13th or commencement of the 14th century, or that the sea has been in reality gradually encroaching on the land since that period. The greater part of the Island has been surrounded by a rough fortification, containing within its area many traces of Tanks and other large buildings, the masonry of which is now entirely in ruins. Tradition universally ascribes these works to a powerful Rajpoot chief, named Mackra Goil, an ancestor of the present Thakore of Bhownuggur. The truth of this is confirmed by the historical researches of the late Colonel Walker, Resident of Baroda, regarding the origin, ancestry, and actions of the principal Katiawar chiefs. It appears that Mackra Goil retired to the Island of Perim, where he built the fort alluded to about the close of the 13th century, and that he was slain in battle by the troops of the first Tougluck † or Togrulshah of the Kulgean ‡ dynasty of Delhi about the year 1300. These buildings are constructed entirely of blocks of the same conglomerate and sandstone found in such quantities on the island. It is evident that the neigh-

* This distance I think rather underrated.

† The first Touchluck-Ghiapeiddeen.

‡ See Ayeen Akbery, Vol. I., page 94, Table 4.

bouring reefs, which must have furnished the former material, have been quarried in many places, and large angular blocks are met with, which look as if they had almost been chiselled the preceding day. Especially on that part of the reef where the organic remains are principally discovered are these indications numerous, but most frequently are they close to the low water mark spring tides, and of course it is only during these tides that the spot I mean to indicate can be visited. Here, then, at a part of the reef bearing from the light-house, South and by East, and distant from it more than two miles, near *to low water mark spring tides*, are two large stone Elephants, cut with their pedestals out of the solid rock, and which have never been moved apparently from the spot where they were first worked: a sketch of one of them was made while standing on the other (which is close by) by Dr. Nicholson, a rough copy of which, with its dimensions,* I have the pleasure of sending you. Though exposed to the fury of the sea for the last five centuries, *unless the level of the reef has been lowered within that time*, or the height of the water-level has been raised, it is still but little the worse for wear. The other is broken, and is not so perfect. I think we have some grounds for placing faith in the tradition that these, as well as the other traces of man's abode upon the island of Perim, are to be attributed to Mackra Goil. The fort was destroyed after his death; and who so likely to be the author of such works as the only sovereign who ever resided upon the island? I am not aware that any person of consequence has since resided there, with the exception of a great Surat merchant who retired there for a short time about 80 years ago, to escape from the tyranny of the reigning Nawab. Legend, besides, is not unfrequently a good substitute for authentic history in this country. The memory of facts is preserved, though wrapped up in fable. But, where collateral proof is not wanting, as in the present instance, we are warranted in reposing some confidence on a general belief, which neither draws upon our credulity, nor is altogether unattested by documentary evidence. But whether to Mackra Goil, or to some other person, these relics of other times are due, it is clear that either they have wonderfully survived the fury of the tides and monsoon tempests for five centuries, or that the level of the reef is not the same as it was

*

	feet.	inches.
Length from head to tail	7	6
Breadth of back	4	6
Height from forefoot to shoulder	6	½

when they were cut out of it. If the former, it is strange that a spot should be selected for these and other works (for traces of the chisel are clearly visible in many parts adjoining, and two blocks of several tons weight are shaped into angular forms and lying near); it is singular, I repeat, that such a spot should be selected, which is only uncovered twice during the 24 hours, and at the period of spring tides.

The best time for discovering good specimens of these fossil remains at Perim is during the monsoon. At that time a trusty agent might be very successful. Heavy rains then wash away the thick deposits of mud left on the reef by the tides, which makes the search for fossils during the dry season difficult, and success precarious."

Note on the discovery of Fossil Bones of Mammalia in Katiawar, by Captain Fulljames.

CONSIDERING that the Island of Perim had once formed part of the main land of Goelwaur, a district of Katiawar, and that there was every probability of fossil remains being discovered on the Coast, if not inland also, I took the first opportunity in my power of ascertaining this interesting fact, and it is with much pleasure that I am able to state that fossil remains are not only to be found along the Coast as far as Gopnat Point, but some distance in the interior also.

In the month of May 1837, I examined the coast from Gogo as far as the mouth of the Setroonjee river, which takes its rise among the hills to the Westward; its chief source is from a hill called "Seetroonjee ke phar," hence the name of the river; but now better known as "Pallytana," from its famous Shravuck temples.

At the village of Thulsar, 5 cos to the south of Gogo, I found some few fossil remains, though chiefly in a very imperfect state, being greatly decomposed, and bared from the matrix by long exposure to the action of the sea and atmosphere. The swell during the South West Monsoon is particularly heavy on this coast, while the devastating effects of a strong tide must greatly assist in the work of destruction. Persons who have not visited the Gulf of Cambay during spring tides can form very little conception of the irresistible force of the first rush of the tide, but if you can imagine a wall of water, three or four feet perpendicular in height, and extending across the Gulf as far as the eye can reach, approaching you at the rate of twelve miles an hour, and with a noise that cannot fail to give you notice, if it does not alarm you,

you may then have some conception of its power. A boat to be caught in this, broadside on, is certain destruction, and many boats as well as lives are yearly lost by this destructive agent.

The strata on the coast at Thulsar is similar to that in which the fossil remains on Perim are found, though perhaps not quite so compact or hard, but lying horizontal as at Perim. In the small hills around Thulsar the same conglomerate occurs, but from exposure to the atmosphere, without the effects of the sea and tide, it has become very hard; large fragments are found close to the village, and inland as far as I went. From the appearance of the country, and these small rounded Hills, generally of a conical form, I should be inclined to attribute their formation to volcanic agency.

At the village of Moorchund, a few miles inland, the formation is the same; these Hills are generally bare of Jungle, while in the valleys between, very dense jungle exists, chiefly the "Kakra" or Bastard Teak tree, and the Bher bush, and such like, with abundance of grass, and in most seasons water. In a nullah at the bottom of one of these hills I discovered a large bed of Fuller's earth, which the natives use for whitewashing their houses; it is also sold as an article of medicine, it being considered by the natives extremely beneficial to ladies in the family way, and is generally used by them.

While hunting in these Jungles some years back, I remember crossing one of these conical hills which was quite bare, and covered with a soil resembling very fine ash dust that had been suddenly quenched with water, and made the same noise under the horse's feet when going over it; and on my last tour tried to find this hill but was not successful.

Between the villages of Lekurka and Kutherpoor still following the Coast, trap rock appears about one mile inland; between the villages of Soochea and Mannar, a soft conglomerate rock appears similar to the Thulsar strata. In the bed of a large nullah to the South of the village of Mannar, trap rock again appears. At Chotah Gopnat Point, which projects some distance into the Gulf from the general form of the Coast, the strata is similar in all respects to the Perim formations, and here I found the most perfect specimens of fossil remains that I discovered on the Coast; and had I been able to spend a sufficient time here, I have no doubt but that I should have been amply awarded.

From thence to a village near Tullajah, a trap rock again appears,

jungle disappearing, and where not under cultivation, yielding a scanty grass. Cotton and Badgree are grown; the latter is particularly fine in these Districts.

The village of Tullajah is situated on the Southern bank of the Seetroonjee Nuddee, and near the foot of a conical Hill, on the top of which is a pagoda; to the N. W. a range of Hills runs away to the Westward, all of trap formation. This conical Hill from a distance particularly strikes the eyes, appearing as a large Pyramid rising out of the plain. The hill in question has been in olden times a place of great strength: the remains of a wall and gateway are still to be seen, and some old iron guns are still lying about. The Temple is now the only secure place, a strong stone wall is built round it, but evidently of recent date; the rock on which this Temple is built looks like a large mass of bloodstone.

The lower part of the hill rests on Basalt; about midway laterite appears, in which strata are the evident remains of its having in former years been the refuge or abode of some Brahminical sect: the caverns and excavations with which the hill abounds are numerous, chiefly facing the Northern and Western sides of the Hill. There is one large room measuring 29 paces by 23 paces in height; it is about 20 feet with a flat roof; this has originally been supported by four large square Pillars, as may be seen by the marks in the ceiling, and also on the floor. There are numerous others, but much smaller, some of them have been used for cooking, some for sleeping rooms, but by far the greatest proportion are reservoirs holding the purest rain water, and small channels are cut all over the hill for conveying the rain water into these reservoirs as in the caves of Kanary near Bombay. Not an ornament or an inscription of any kind could I discover, though I hunted long and diligently for them; still some other person may be more fortunate, and I really think it worth the while of any person who can spare the time to explore them.

The Seetroonjee Nuddee takes its rise in the Seetroonjee ke phar, and falls into the Gulf of Cambay above Gophat Point; this hill or mountain is better known as the "Pallytana Hill," on which so many splendid Shravuck Temples are built and still building. The stone of which these temples are built comes from Gopnat Point, to the Southward of the Seetroonjee Nuddee. It is there quarried to a vast extent, and sent in the rough to the town of Pallytana, where every stone is cut and fitted, and the Temple put

together, with the exception of cement; it is then taken down, every stone being marked and carried by "now gunnies" or Bamboo Koolies up the Hill; the distance they reckon to be three cos. To form some idea of the difficulty of the ascent, I should mention that two large bricks are considered a good load for a woman to take up; chunam is taken in cloth bags, and every thing that is required for building, excepting water, which they get from Tanks or Koonds on the hill; these temples are surrounded by a high wall, and an Arab guard is kept up for the protection of the valuables belonging to the different Temples.

At Girnar, report says there are a race of men similar to Cannibals that live in the Hills; the same is said of Pallytana;—at and around Pallytana lions abound, and these I rather suspect are the Cannibals.

To the West of Gogo, and near the remains of some Jain tombs, I found other fossil specimens in a similar formation to that of Perim which was being quarried for building purposes at Gogo; the rock lies close to the surface and in thin layers, with seams of indurated clay between each. To the North of the Gogo creek, though only a few yards wide, not a sign of rock appears; when to the South it is one continued bed. It may not be out of place here to mention, that in boring for water close to the bunder at Gogo, after passing through many different strata of conglomerate, a bed of sandstone 35 feet thick, a stiff black and bluish clay was met with, similar to the London clay, and holding balls of Septaria; this clay was never passed through, though the bore was carried to a depth of three hundred and fifty-six feet.*

At Chumaree, about twenty miles from Gogo, and lying North West, some conical Granite Hills rise out of the plain composed of large boulders, heaped one above another;—these Hills diminish in size, from the N. W. to the S. E. A soft fine grained sandstone appears below these Granite boulders, the hills themselves dip from the West to East, the last scarcely appearing anything more than a mound of earth. To the South of these there is an extensive salt plain, with numerous small nullahs all falling into the Bhownuggur creek.

GEO. FULLJAMES.

June 8th 1841.

* Compare this important fact with that mentioned in Mr. Lumsden's letter, of the bottom of the deep channel between Perim and Kattiawar being composed of a stiff yellow clay, while the shallow edges of this singular "pit" is composed of the fossiliferous conglomerate.

COUTTO'S DECADE VII.—BOOK III.—CHAP. X.

Of the famous Island of Salsette at Bassein, and of its wonderful Pagoda called Canari; and of the great Labyrinth which this Island contains.

Communicated by the Revd. W. K. FLETCHER.

THE City of Bassein is the largest, and comprehends more Territory than all the others of India, because towards the East it extends to the Forts of Assarim and Manora, which are about eight leagues, and contains rich Villages yielding great revenue. Towards the North it extends to the River of Agacain, and towards the South to the River of Bombay, or even a little further to another arm which is called Carania, as it makes between the one and the other a small Island in which we have a Castle of that name. The River which surrounds the Island of Salsette has two branches; that to the North is the River which runs along the City of Bassein, and continues its course to the South in several windings; and about half way, in a place distant about three leagues, the Portuguese established a Colony called Tannah, which is the residence of about sixty Portuguese, who possess in that Island their Villages, which are very productive. Here the River has two very narrow passages, and a person can ford it at low water from the Country of the Moors to the Island of Salsette; near these passages there are two Castles seated on a rock over the water to defend this pass. The river then continues its progress to the West about three leagues, and forms the beautiful Harbour of Bombay, which extends itself to the sea more than half a league in breadth, where all the Ships from Portugal and other Countries ride in from its good soundings, having no sand bank nor any other impediments; and before it reaches the sea it extends one arm towards the South, which makes the Island of Caranja, and another towards the North which is the Island of Bandora. From this mouth of the Bombay river it directs its course to the North Coast about four leagues until it enters the Harbour of Bassein, and leaves the Island of Salsette on the sea side, which is reckoned to be fifteen leagues in circumference, and two in breadth.

In the centre of this Island there exists that wonderful Pagoda of Canari, thus called from its being supposed to have been the work of the Canaras. It is constructed at the foot of a great Hill of Stone of light grey color; there is a beautiful Hall at its entrance, and in the yard that leads to the front back door, there are two human

figures engraved on the same stone, twice as big as the Giants exhibited on the Procession of the Corpus Christi Feast in Lisbon, so beautiful, elegant, and so well executed, that even in Silver they could not be better wrought and made with such perfection. The front door has some cisterns hewn out of the same rock, which receive the rain water, and it is so cold in the summer, that there is no hand that can bear it. From the foot to the top of the Hill there are more than three thousand small rooms like cells, cut out of the same rock in the shape of snail shells, and each of them has a cistern with the same water at the door ; and what is more to be wondered at is, that there is an aqueduct constructed so ingeniously, that it passes through all the three thousand apartments, receives all the water from that Hill, and supplies it to the cisterns that are at the doors of the rooms.

This Pagoda was inhabited by many Joguees, who lived there on the alms that were given them by the people of the Villages. The Chief of them was a hundred and fifty years old, whom the Priests of St. Francis, who first came to the City of Bassein, made a Christian, and called him Paulo Raposo. They also baptized another Joguee, by the name of Colete, who had more reputation than Paulo Raposo, and was named Francisco da Santa Maria. He lived afterwards as a good Christian, to the great satisfaction of these Priests, became an Evangelical Preacher, and converted several of his Brothers, and other heathens. This man lived after his conversion five years, and it may be said according to Similo, that he did not live more than those five years. The first Priest who resided in this Island, and converted these Joguees, was called Fre Antonio de Porto, of the order of Menorites, —a person of virtuous and exemplary life, who penetrated into all the secrets of this Island, which were many.

In this said Pagoda, called Canari, was consecrated a Church dedicated to St. Michael, and while he stayed there, he was informed of the novel, wonderful, and intricate labyrinth not to be compared to any in the World ; and as an account of it will be entertaining, I shall give a brief relation of it.

During the residence of the Revd. Fre Antonio de Porto in the Church of St. Michael, he was told by the Christian whom he had converted, that there was a labyrinth in that Hill whose end had never been traced, and it was moreover stated that it extended as far as Cambay. The Priest, desirous of getting in to see this wonder and

the magnitude of this work about which so much was said, took one of his companions, and collected twenty persons with arms and match-locks to defend themselves against wild beasts ; and some servants to carry the necessary provisions for the journey, viz. water, rice, biscuits, vegetables, &c. and some oil for the torches, which were taken to light the place, in order that they might see their way through ; and they also took three persons, provided with bundles of strong ropes for the purpose of laying alongside of their way as they proceeded, as was done by those who entered the labyrinth of Crete. Thus prepared, they entered the caves by an entrance about four fathoms in breadth, where they placed a large stone, to which they fastened the point of the ropes. They travelled through the caves for seven days without any interruption, through places some of them wide and others narrow, which were hollowed in the rock, and on each side they saw small chambers like those in the Pagoda above mentioned, each of which had at their entrance a cistern, but no one could say whether these cisterns contained any water, or how they could receive any, for in all these passages they could not discover any hole, crevice, or any thing which could throw any light on the subject. The upper part of the building was cut out of the same rock, and the walls on each side of these roads were done on the same way. The priest seeing that they had expended seven days without being able to find any opening, and that the provisions and water had been almost consumed, thought it necessary to return, taking for his clue the rope, without knowing in these windings whether he was proceeding up or down, or what course they were stirring, as they had no compass for their guidance.

As I was talking with some old Hindoos about it, they asserted that through that road a person could go to Cambay and even the country of the Moghuls and the Town of Agra, and that this road in former times was much used and frequented, of which mention is made in the Books of ancient Hindoos, that there are numerous roads like this, constructed under ground in several parts of Cambay, and the Deckan, and that beyond doubt this road was the work of that powerful Hindoo king called Bimilamenta, who above one thousand and three hundred years since had ruled over the East, from Bisnagur or Bengal to the Moghuls' Country, and even Ormuz. It is recorded in their books, that he lived three hundred years, and reigned more than one hundred. The natives in all their narratives mix many fables and fictions in order to give honorable origin to their Monarchs, as

we have frequently said ; they accordingly assert that Bimilamenta was a Hindoo, a wise man, and gifted with good sense, and was a native of Magor, Cedepur, and Patan, where he was leading a religious life, and to whom it is said appeared an idol of ancient Hindoos, called Ambani, and it revealed to him many treasures and delivered to him several laws, which he was required to cause to be observed by those Hindoos who lived without them, wandering in the deserts like brutes, to maintain them in proper order, and unite them in one common tie and interest. This he accordingly did, built for them Towns, formed Villages, and established colonies, and he was chosen by them as their King. The munificence of this man, recorded in history, is astonishing. It is affirmed that he made these labyrinths, and caused an immense number of Pagodas to be built with admirable art, and that those of Canari and Elephanta were his works. While I was writing on this subject, some wealthy Banian Merchants of Cambay, who have dealings at Goa, called on me, and having spoken to them about it, they replied that it was all true ; adding that they had read the Books which treat of this subject, and that they with their own eyes had seen also some celebrated Pagodas in the Deckan, Cambay and Magor, built by this king, and on the gates of each of them there was an inscription which ran thus—" This Pagoda was ordered to be built by the king Bimilamenta," which they read several times, and if it be so, the stone over the Gate of the Pagoda of Elephanta, which was sent to king D. John III. had no doubt these words, though no one could be found to decipher them. It is written also, that he caused many beautiful tanks to be excavated, and some of them so large, that they might be called great lakes, with which all these countries abound : and to some of them peculiar virtue is ascribed, such as the one in midway between Bassein and Agassain, where the Church of Nossa Senhora dos Remedios stands, in which the Priests of the order of St. Domingos reside. This Lady has performed so many wonders and miracles, that all the Walls of the Church are covered with pictures representing them. In front of this church is the Tank to which they attribute so great a virtue, that they affirm that any person that gets into it will be healed of any complaint they may have, and the Priests watch it with so great care, that they never allow any Hindoo to approach it, for fear of their performing any superstitious ceremonies.

To return now to the labyrinth—having seen that these priests travelled through it seven days without taking any rest, except at dinner

and sleeping hours, they must have travelled at least six leagues every day, which in seven days would amount to forty-two leagues; it appears to me therefore, that what the Hindoos say—that it reaches as far as Cambay—may be true, because the Island of Salsette at most is only four leagues long, and the labyrinth is in the centre of the Island. To say that the roads could have many windings, and be so intricate as to make them spend seven days, is impossible: the Island (as I said) being very small and narrow. Be that, however, as it may, the cause of its not being known is the great apathy and want of curiosity on the part of our Portuguese Nation. To this day no Vice Roy or Governor of Bassein, or any other person, has taken means to ascertain these secrets which it is so desirable to know. This would not have happened with any Foreign Nation, who are so much more wise and curious than we, not only as regards things like these, but others of less importance, which they do not leave alone until they are sifted to the bottom. This work may certainly be reckoned one of the wonders—and perhaps the greatest in the world.

In the Island of Salsette there was also another Pagoda called Manapazer, which is also cut out of solid rocks, in which lived a Joguee, very famous amongst them, called Ratemnar, who had with him fifty Joguees, whom the inhabitants of those Villages maintained: and the Priest Fre Antonio de Porto being informed of it, went to him; but the Joguees of that Island had so great a fear of him, that no sooner they saw him than they left the Pagoda and went away to the interior. This flight cannot be ascribed but to some Divine Power which they found the Almighty had bestowed on his servant, for no human being could frighten fifty men when they saw only two Friars clad in sacks, and bearing no weapon with which they could offend them. The Priest entered the Pagoda, converted it into a Temple dedicated to Nossa Sra. de Piedade. A Royal College was subsequently established for the Island of Salsette for the reception and education of the children of all the people converted to Christianity, to which the king D. Joao granted the revenue and property formerly belonging to the Pagoda, and it is now administered by the Priests of the order of St. Francis.

Having spoken to some very old Christians, and those first that were converted by the Priest Fre Antonio de Porto, and having seen the House of Manapazer, one of them who was said to be more than an hundred and twenty years of age, and who spoke well the Portuguese

language, could write and read, and was reading the Flos Sanctorum and the Lives of Saints, assured me that there was no doubt that the Canari Pagoda was ordered to be made by the Father of the Prince St. Josaphat, whom Barlao converted to the Christian Faith, with the view of shutting him up there in consequence of his Astrologers having foretold that the Prince would profess the Christian religion. Thus his birth and life, according to their scriptures, as to this day the Hindoos recite in their songs, corresponds so much to that of St. Josaphat as we have in his Legends, that I was surprised at what they related to me of him; and as an account of it will not be uninteresting, I shall detail it here as briefly as possible.

It is written in their books, that a king who reigned in all the East (and I think this king must be the same called Bimilamenta of whom I have already spoken, and is said to have ordered the Pagoda of Canari to be built) had a very beautiful son, who the Astrologers, in consequence of the day on which he was born, foretold would become a Saint, and despise the kingdom of his father, and turn a Joguee.

The Father with this news became very uneasy, and wishing to avert it, ordered him, as soon as the child was weaned, to be shut up in a Palace which he had caused to be made for the purpose, of admirable workmanship, well enclosed and guarded, that he might not have any communication except with persons appointed by the king, and that he might never see things that could occasion him any pain, grief, or sorrow. There he remained till the age of eighteen, when he requested his Father's permission to see the Cities and Towns, which was accordingly granted. And as he was proceeding surrounded by his domestics, he saw a lame man walking with a crutch, and having asked what it was, they replied that it was common in the world to have maimed people, lame, blind, and with other defects of this nature. On the second occasion when he went out, he met a very old and decrepid man leaning upon a staff, and trembling; and the Prince, struck with this sight, enquired what it was, they answered, that it was in consequence of the man having lived a great many years. Another day he met a corpse going to be buried, accompanied by the children of the deceased lamenting the death of their Father, and his attendants having told him what it was, "how," said he, "I and all of us will thus die?" they having replied that it was the common lot of men, because all were born to die, he was seized with melancholy, and while this idea was preying on his imagination, it is said he saw a Joguee, who having held

a conversation with him, persuaded him to despise the world and to lead a solitary life. And as he was uneasy and had more liberty, he contrived means to disappear and wander through the world. About the manner in which he made his disappearance many things are said, mixed with fables, as is customary with the Hindoos on all such occasions.

This Prince, they say, went to the Island of Ceylon, taking with him a great number of Joguees, who were his disciples, and he fixed his abode in that Mountain which is called Adam's peak, where he lived many years leading a holy life. And being about to quit that place, his disciples, who were to remain behind, requested him to leave them some token to preserve his memory. He accordingly is said to have pressed his foot against a stone, and left his footprint on it as if it were some soft wax, which is worshipped and respected for that of our Father Adam, and is held by all in great veneration, as I have mentioned in chapter XX. of Book VI. of my V. Decade, wherein I give an account of this footstep very circumstantially, and show how this Island of Ceylon is the Tapobrana of Ptolomeus, and in which I detail many curiosities, such as no author has treated of. This person is called in their scriptures by many different names, but the chief is Drama Rayo, and subsequently when they took him for a Saint, they called him Buden, that is to say, Wise; for whom all the Hindoo people throughout all India have erected many costly and magnificent Pagodas, and in their Legends a great many wonders are related of him, which I omit merely not to tire my readers.

COUTTO'S DECADE VII.—BOOK III.—CHAP. XI.

Of the very remarkable and stupendous Pagoda of Elephanta.

Communicated by the Revd. W. K. FLETCHER.

THIS remarkable and above all stupendous Pagoda of Elephanta is situated in a small Island about half a mile in circumference, which marks the Bombay River, just when it is about to enter the Sea from the Northward. It is so called, on account of a great stone Elephant in the Island, which is seen on entering the River, and is said to have been built by a Hindoo king, named Banasur, who became master of every thing from the Ganges inwards. It is affirmed (and so it appears) that immense sums of money were expended on this Pagoda, and that millions of workmen were employed on it for many years. The site of this Pagoda extends from North to South; is nearly open on all sides,

particularly to the North, East and West, and the back of this temple lies to the South. The body of the Pagoda is about eighty paces in length and sixty in breadth; it is all hewn in solid rock, and the upper roof, which is the top of the rock, is supported by fifty pillars, wrought from the same mountain, which are so arranged as to form the body of the Temple into seven naves. Each of those pillars is twenty-two spans square, and from the middle upwards is eighteen spans round. The stone of the Mountain where this Pagoda has been carved is of a grey colour, but the whole body inside, the pillars, the figures and every thing else had formerly been covered with a coat of lime mixed with bitumen and other compositions, that made the Pagoda so bright, that it looked very beautiful and was worth seeing; and not only the figures looked very beautiful, but the features and workmanship could be very distinctly perceived, so that neither in silver or wax could such figures be engraved with greater nicety, fineness or perfection.

On entering the Pagoda, to the right hand there is a chapel with a gate sixteen and a half spans broad, and fifteen and a half high. Within the chapel there are many idols, and in the middle there is one seventeen spans high, with a large and beautiful crown on the head, so nicely made, that it appears to have been painted rather than carved in stone with the chisel. This figure has eight hands and two legs; one of the right hands holds a sceptre with a snake round it like that of the Mercury. Over the top of the sceptre there are three small idols of a cubit each: one of the left hands supports in its fingers three other idols of the same size. To the left there is another large idol, with a cymitar, and over it another very large one, with the body of a man and the head of an Elephant, from which I think the Island took its name. In this idol they worship the memory of an Elephant, whom the Hindoos call *Gaves*, of whom they relate many fables; near this idol issues from the rocks a stone seat in which is seated an idol with one body and three heads, each of them having one hand except the middle one, which has two, and in the left hand holds a book. To the left of this idol there is the figure of a woman three span-high—her left hand resting on the shoulder of another small figure of a woman, and the right hand twined round another even smaller figure. Immediately above this idol there is another mounted upon the head of an Elephant, and near this another on the neck of another idol.

Two paces from the chapel towards the meridian this Pagoda begins

to widen eleven paces towards the West, thence to proceed towards the South another eleven paces, and returns again towards the West eleven paces, where there is, to the right hand, a chapel hewn in the rock seven and a half feet high and sixteen broad, with a gate twenty-six spans high. In the middle of this chapel there is an idol in a sitting posture, twelve spans high from the waist upwards, with a very curious and beautiful crown on the head. It has eight hands and two legs, and with one of its right hands and another of the left spreads over the head a canopy of the same stone, and there is above it in the air a sort of barrack, with many male and female idols one cubit each on it. In the second right hand it has a two-edged sword, and in the third a small idol hanging by the legs. The fourth right hand with a part of the arm has been broken by the frolic of the soldiers of the fleet that visited the place, as is nearly the case with everything else. In the second left hand it has a a little bell, and across the shoulder a large collar of many little human heads strung together, and all hewn in the same stone and engraved on the neck itself. In the third hand it has a kettle with a small idol on it. The fourth left hand, with the arm, is broken. On both sides of this idol and throughout the chapel there are thirty small idols standing. A few paces from this chapel to the right hand, which lies to the South, there is a square room ten paces long and as many broad, hewn in the rock, and so constructed as to admit of a person walking all around it, and has a door on each side of the square; and this room is entered into by each of these doors which has a ladder of five steps, and in the middle of this chapel there is a square stone seat of twenty-four spans, where there is a figure of an idol so very dishonest that we forbear to name it. It is called by the Hindoo Linga, and is worshipped with great superstition, and it is held in such estimation that the Canarese Hindoos used to wear such figures about their neck. A Canarese king of sound principles and justice, abolished this shameful custom.

These four gates of this house, the sockets of which still exist, were never opened except once in the year, on the day of its greatest festivity, to show in what veneration they held the idol in question. At the entrance of this house there are two beautiful giants twenty-four spans high. Ten paces from the chapel going towards the meridian there is another chapel with a beautiful porch of mosaic workmanship, twenty-four feet broad and twenty-six high. In the middle there is an idol sixteen spans high, with four hands and two

legs, and one hand round another idol of a female figure. To the left of this idol there is another of equal size, and below it another small one with three heads, four hands, and two legs, and around all this chapel inside there are many other idols. From this chapel to the West there is a cistern of very excellent water, the bottom of which has never been found, as it is commonly said, and it is therefore like what is said of the fountains of Alfeo and Arethusa.

Here ends the western wall, which is that of the right hand of the body of the Pagoda. Returning hence to the West there is a chapel very curiously worked, fourteen feet broad and eighteen long. In the middle there is an immense idol, with crossed legs and a very beautiful crown on the head, and on both sides there are many Pagodas of men and women, and some on horseback. Thence the Pagoda begins to extend towards the East, where there is another chapel like the others, and from beneath it issues an idol from the waist upwards, very large, with five faces in proportion to the body, with crowns on the heads, and twelve hands, with which it supports a stone seat, over which there is another immense idol, with one face, six hands, and two legs, having one of the right hands over the neck of a woman, also very large, sitting by him, and on each side of the idol there are others of nearly the same size, seated on the same seat ; and in the body of the church there are about a hundred more idols of the figure of men and women. Proceeding thence towards the meridian, there is another chapel with a giant-like idol sitting in the middle of it, with a crown on the head, and with four hands and two legs, having on each side a large idol, one of the figure of a woman and the other of a man, besides many other idols that there are in the chapel.

Here ends the eastern wall, which is that of the left hand of the Pagoda. At the end of these two eastern and western walls of the Pagoda there are three large chapels. That in the middle which lies more to the interior is thirty feet broad and sixteen long. From the pavemant of this chapel issues a body from the waist upwards of so enormous size, that it fills the whole vacuum in length and breadth of the chapel : it has three large faces, the middle one looks to the north, the second to the west, and the other to the east. Each of these faces has two hands, and on the neck two large necklaces, wrought with considerable perfection. These figures have on their heads three very beautiful crowns. The middle one, which is bigger than the others, holds in one hand a large globe, and whatever it had in the right

hand cannot be discovered, as it is all defaced. The face on the right side holds in the right hand a cobra di capello, and in the left a rose called Golfo, which are produced in large lakes. At the entrance of this chapel there are two Giants standing on each side of an idol ten spans high. The second chapel which is to the right side is nineteen feet broad, eleven long, and thirty high, and has in the middle of it an immense idol with four hands and two legs, as all the others, and a beautiful crown on the head, and above it there is another of the figure of a woman twenty spans high. Throughout the whole of this chapel there are many other small Pagodas. To the right side of this chapel there is a gate seven feet high, and five and a half broad, which communicates with a dark square chamber ten paces broad and as many long, and there is nothing in it. Turning to the other side of the middle chapel there is another twenty-three feet long, and thirty broad, having in the middle another idol twenty-two spans high, with four hands, and standing upon one leg only, with a beautiful crown on the head, which rests on that of a Bull. The ancients believed this idol to have been half man and half woman, because it has only one breast like the ancient Amazons, and has in one hand a cobra di capello, and in the other a looking-glass. In this chapel there are more than fifty idols. To the left side of this chapel there is a gate six spans high and five broad, which communicates with a room nearly square and very dark, where there is nothing to be seen. With this ends the edifice of this Pagoda, which is injured in many parts, and whatever the soldiers have spared is in such a state that it is a great pity to see thus destroyed one of the most beautiful things in the world. It is now fifty years since I went to see this extraordinary Pagoda, but as I did not enter it with that curiosity with which I might have done now, I did not remark many things that do not exist now ; but I recollect finding there a chapel, which is not seen now, open all through the front, about forty feet long, and along the Rock there was an elevated place, of the length of the House, like our altars both in breadth and height, with many remarkable things on it : among them I recollect having remarked the story of Queen Pacefac with the Bull, and an Angel with a drawn sword turning out from underneath a tree two very beautiful figures of a man and woman, both naked, as the holy Scripture represents our first ancestors, Adam and Eve.

When the Portuguese took Bassein and its dependencies, they went

to this Pagoda and removed a famous stone over the Gate which had an inscription of large and well written characters, which was sent to the king, after the Governor of India had in vain endeavoured to find out any Hindoo or Moor in the East, who could decipher them. And the king, D. John III., also used all his endeavours to the same purpose, but without any effect, and the stone thus remained there—and there is now no trace of it.

On the side of the Hill where the Pagoda stands, about two stone throws to the East, there is another Pagoda open in front, and the roof is supported by many pillars beautifully executed, of which only two now exist, and are nineteen spans high and twelve thick. This temple is forty-three paces long and thirteen wide, and at one side there is a small room most beautifully worked. There they worship the Goddess Paramisori. This Pagoda, which is now entirely destroyed, was the most stupendous work of its size.

In another hill of this little island towards the East as regards the great Pagoda nearly in the middle, there is another Pagoda which formerly admitted of an entrance by a gate which had a marble porch very curiously executed. This pagoda has a large hall and three rooms in the first, to the right hand; there is nothing now left; the second has two idols seated in a large square seat. One of these idols was called Vethala Chenday, with six hands and only one head, resting on two smaller ones on each side of it.

Both this large and the other small Pagodas are known from the writings of the Hindoos to have been the work of a Canara King called Banasur, who ordered their construction, as well as of some famous palaces near them where he resided, of which even in my time there were some marks, and many ruins of cut stones and large unburnt bricks. These palaces, or this city which is said to have been very beautiful, was called Sorbale, and the hill where the Elephant Pagoda stands, Simpdeo. A daughter of the King called Uqua, who dedicated herself in this Pagoda to perpetual virginity, lived here for many years. The ancients say that during the time of King Banasur, gold rained once for the space of three hours at Elephanta, and it was therefore called santupori, *i. e.* golden Island. I do not relate many particulars connected with the Pagoda, as they are so many that they cannot well be particularized, and will tire the readers.

COTTON CULTIVATION IN THE BOMBAY PRESIDENCY.

The Bombay Presidency has long exported large quantities of cotton both to Europe and to China. Some of this, usually quoted in price currents under the names of Surat and Broach, brings higher prices than any other cottons cultivated in India by the natives, and the best Surats are often quoted at prices only a little inferior to the great mass of short staple American cotton. Both brokers and manufacturers have frequently given very favourable reports on the quality of this cotton, but much of that exported from Bombay is the produce of Mahratta countries in the interior or Central India.

Attempts have long been made by the East India Company, both in the Madras and Bombay Presidencies, to improve Indian cotton. A cleaning machine was sent out, and a cotton-farm established at Rhaudaterra, as early as 1794. Foreign seeds were dispatched, instructions on the culture of cotton were distributed, and rewards offered for the improved specimens of it. But as the produce of these provinces still continued inferior to what was required by the manufacturers, cotton-farms were directed to be established in 1829; those in Guzerat were placed under the superintendence of Mr. Finey, after his decease under that of Mr. Martin, and the experimental farms in the Deccan, Candeish, and Dharwar, under Dr. Lush. The cotton grown at the several farms having been sent to England, was reported on by experienced brokers, and the results prove that the cotton of these provinces can be much improved; for though these experimental cottons had been injured in the process of cleaning, probably from inexperience in the use of the sawgin, they are described as being worth from 6¾d. to 9½d. per pound. There is no doubt that in suitable soil, and with the careful culture of the Broach districts, the improved processes of American agriculture would produce still greater improvement, and at all events a greater return of cotton per acre.

Keeping in view the principle stated under the head of Bengal, it would be desirable to have the experience of the American planters extended in the Bombay presidency over as wide a surface of country as possible. The best cotton districts are widely separated from each other, and at opposite points of the Bombay territory. These are the southern Mahratta country, about 16° N. lat., where the experimental farms were established, because presenting tracts considered by

Dr. Lush well suited for the purpose. Guzerat and Cattywar are the districts where the well known superior cottons are already grown by the natives; in consequence of which these were selected as the sites of the northern experimental farms, and much favourable lands for the purpose is found between the latitudes of 21° and 24° North. This part of the country was the site of the experiments of Mr. Assistant Surgeon Gilders, in 1816-17, who, having observed the causes which led to the failure in the attempt to introduce the cultivation of Bourbon cotton into the western districts, considered the obstacles to have been exclusively of a physical nature. He at the same time stated, that both the soil and climate of the districts lying between the Subermutteé and the Myhee promised a favourable result. The cotton grown by Mr. Gilders was considered at Bombay fully equal to any produced in Bourbon, and in London as the best specimen that had been imported from Bombay raised from Bourbon seed. It sold for 15d. per lb. With so much sagacity had Mr. Gilders selected the site of his experiments, that fifteen years afterwards Dr. Burns collected seed from trees growing apparently wild. These being sown, produced plants from which the cotton was pronounced equal to the best from New Orleans. The cotton grown at Laberkowa, within two miles of Mongrole, though confined to a space of 200 beeghas, or thereabouts, is so highly valued, that on the spot it will fetch six-sevenths of a rupee per maund more that any other kind in that part of the country; yet the natives say they frequently use seed from Guzerat, or any part of the country. The superiority must, therefore, depend either upon peculiarity of soil and climate, or excellency of culture. One point only of the latter is related, but that is one of great consequence. For instance, the people are in the habit of carefully extracting the cotton alone from the pod in the field; and this is, probably, of considerable importance, as some of the American planters are of opinion, that the staple of Indian cotton is much injured after it is collected, by being allowed to heat when piled up, often for a long time, before it is cleaned.

As the poorer soils of India have been found to suit the American cottons better than the black soil, and this latter to agree with the indigenous cotton, it is desirable in the Bombay, as in the other Presidencies, to include, in the experiments, both the black and the other soils of the country. Though the cotton is good, and very abundantly produced, the chief difficulty seems to be the shortness of the sca-

son for ripening the cotton, conveying it to the outports, and shipping it before the accession of the rains. This might probably be obviated by earlier sowing; perhaps, also, by bringing forward the crop by irrigation, and for this the rivers in the northern parts of Guzerat afford great facilities. The profits attending the culture of cotton appear to be considerable, as Dr. Lush says he is "convinced that the grower and the merchant may get ample profit when the best India cottons are at 5d. per lb."—*Royle's Productive Resources of India.*

METEOROLOGICAL OBSERVATIONS, BOMBAY OBSERVATORY.

These observations were made almost entirely by the two Assistants at the Observatory, SANARDHAN PANT and KERU LUXOMAN. The time is the Observatory mean time, calculated from transits of several stars observed every day. The Barometer is a standard barometer, by ADIE of Edinburgh, lent to me by Mr. G. BUIST. The detached Thermometer is by NEWMAN, of Regent Street; but little dependence can be placed on the results, on account of there being no room in the building adapted for thermometric observations. The wet bulb is a small Thermometer, which bulb has been kept wet by repeatedly dipping its bulb wrapped in cotton. The wind has been noted by the laseer watch at the Lighthouse, and I am indebted to Mr. HAYMAN for being allowed to copy them.

I have added a graphical representation of the barometric curves for the 21st April, May, and June, by which the form of the curves and the period of maximum and minimum will be understood by inspection.

A. B. ORLEBAR.

21ST APRIL 1841.

Time.	Hour.	Barometer.	Thermometer. Attad.	Thermometer. Dotad.	Wet Bulb.	Winds.	Remarks.
A. M.	0	29·980	81·1	81·2	72·6	N. N. E.	An arc of Cumuli moving from the S. W.
..	7	30·010	81·2	81·3	74·2		
..	8	·024	82·6	85·0	74·0	N. W.	
..	9	·034	84·9	84·0	74·6		
..	9½	·037	85·2	85·2	75·0		
..	10	·030	86·0	85·7	75·0		
..	10½	·035	86·2	86·4	75·5		
..	11	·030	86·3	86·6	77·0		
..	12	·012	86·0	86·2	78·0		
P. M.	1	29·969	85·9	86·1	78·3		
..	2	·943	86·0	86·3	78·0		The Cirri which predominated, gradually gave place to Rain Clouds.
..	2½	·938	85·3	86·0	77·8		
..	3	·930	86·2	86·5	78·0		
..	3½	·924	85·8	86·0	77·8		
..	4	·912	85·0	85·4	78·0		
..	4½	·910	85·0	85·2	77·3		
..	5	·906	84·2	84·6	77·2		
..	6	·913	33·0	83·3	77·0	N. N. W.	
..	7	*·916	82·0	82·2	76·3		
..	8	·970	82·0	82·4	76·0		
..	9	·988	82·0	82·3	76·0		
..	9½	·992	82·0	82·3	75·5	.....	Lightning to the East.
..	10	30·000	82·2	82·4	76·0		
..	10½	·010	82·4	82·5	76·2		
..	11	·012	82·3	82·5	76·0	●	Clouds gathering.
..	11½	·004	82·2	82·4	75·1		
..	12	29·997	82·0	32·3	74·9		
A. M.	1	·990	82·0	82·1	75·8	S.	Lightning and thunder.
..	2	2 ·013	82·0	82·1	76·0	.....	Heavy Rain.
..	3	9·094	81·6	81·3			
..	3½	·980	81·4	81·4	76·1		
..	4	·972	81·2	81·5	75·0	.....	Clearing on the West.
..	4½	·960	80·7	81·1	76·5		
..	5	·979	80·5	80·9	76·3	W. N. W.	Overclouded by Cirri and Cumuli.
..	6	·976	80·5	80·8	76·8		
..	..	29·982	83·3	83·5	76·2		MEAN.

* The above is a curious example of a conflict between the South-west and North-west winds.

21ST MAY 1841.

Time.	Hour.	Barometer.	Thermometer. Attad.	Detad.	Wet Bulb.	Winds.	REMARKS.
A. M.	6	30·011	83·0	83·0	77·0	S. W.	
..	7	·033	84·0	84·1	77·8		
..	8	·002	85·4	85·4	78·5		
..	9	·005	86·5	86·4	78·0		
..	9½	·010	87·0	86·9	78·0		
..	10	·008	87·5	87·3	78·0		
..	10½	·003	87·9	87·6	78·3		
..	11	·972	88·0	87·9	78·6		
..	12	·968	88·1	88·4	78·4	W.	
P. M.	1	·940	88·8	89·1	79·5		Nimbi prevailing.
..	2	·920	89·0	89·5	79·9		
..	2½	·910	89·0	89·8	79·4		
..	3	·902	89·0	90·3	80·5		
..	3½	29·998	89·0	89·5	79·9		
..	4	·982	88·0	89·5	79·4		
..	4½	·979	88·3	88·9	79·8		
..	5	·978	88·2	88·6	79·4		
..	5½	·980	87·5	88·1	79·0		
..	6	·984	86·1	87·1	78·9		
..	7	30·000	85·0	86·0	78·0		
..	8	·010	84·8	85·5	77·7		
..	9	·026	84·5	85·2	77·5		
..	10	·032	84·5	85·0	77·1		Clear.
..	10½	·034	84·3	84·8	77·2		
..	11	·028	84·0	84·6	77·2		
..	12	·016	83·7	84·3	77·3		
A. M.	1	·006	83·7	84·2	77·2		
..	2	·011	83·5	84·7	76·9		
..	3	29·988	83·3	83·9	76·8		
..	3½	30·001	83·2	83·7	76·3		Nimbi increasing.
..	4	·006	83·3	83·7	76·6		
..	4½	29·993	83·1	83·6	76·5		
..	5	·990	83·0	83·3	76·3		
..	6	30·012	82·5	82·9	76·8		
..	..	30·018	85·8	86·3	78·3		MEAN.

21st JUNE 1841.

Time.	Hour.	Barometer.	Thermometer. Attad.	Thermometer. Detad.	Wet Bulb. 1st.	Wet Bulb. 2nd.	Sympiesometer.	Attad. Thermometer.	Wind.	Remarks.
A. M.	6	29·988	82·2	82·3	78·0	78·8	29·78	83·3		
..	7	·926	83·0	83·1	77·9	78·8	·79	83·1		
..	8	·938	84·2	84·3	77·9	79·4	·80	84·3		
..	9	·946	85·6	85·6	79·0	79·9	·76	85·5		
..	9½	·950	86·0	86·0	79·4	80 0	·78	85·9		
..	10	·908	86·7	86·6	79·7	80·0	·79	86·5		
..	10½	·962	86·7	86·7	79.2	79·0	·70	86·8		
..	11	·962	86·5	86·6	79·4	80·0	·76	86·7		
..	12	·958	87·5	87·5	80·1	80·8	·72	87·5		
P. M	1	·940	87·2	87·3	80·6	81·0	·73	87·3		
..	2	·924	85·0	85·6	79·5	80·0	·74	85·2		
..	2½	·914	84·2	85·1	78·8	79·5	·73	84·7		
..	3	·905	86·3	86·6	80·8	81·2	·70	86·2		
..	3½	·900	87·4	87·6	80·7	81·1	·66	87·3		
..	4	·895	87·7	87·9	81·1	81·8	·65	87·8		
..	4½	·882	87·0	87·4	79·7	80·2	·66	87·5		
..	5	·888	86·2	86·8	79·5	80·3	·68	86·9		
..	6	·880	84·6	85·6	79·8	80·3	·70	85·7		
..	7	·885	85·1	85·5	80·0	80·7	·70	85·5		
..	8	·891	84·7	85·3	79·9	80·4	·72	85·4		
..	9	·916	84·6	84·9	79·0	79·8	·74	84·9		
..	9½	·912	84·5	84·9	79·0	79·5	·74	85·0		
..	10	·916	84·3	84·8	78·9	79·5	·74	84·9		
..	11	·924	84·5	84·6	78·9	79·2	·76	84·6		
..	12	·915	84·3	84·5	79·0	79·3	·74	84·5	Rain.	Nimbi prevailing throughout the whole time.
A. M.	1	·908	83·9	84·3	78·5	79·2	·74	84·4		
..	2	·891	83·8	84·1	79·0	79·3	·72	84·2		
..	2½	·883	83·8	84·2	79·0	79·5	·72	44·2		
..	3	·870	83·6	84·0	78·5	79·0	·72	84·0		
..	3½	·868	83·0	83·5	78·8	78·4	·72	83·6	Rain.	
..	4	·860	82·0	87·1	77·8	78·0	·74	83·2		
..	4½	·858	82·2	82·8	79·2	79·2	·72	82·9		
..	5	·868	83·0	83·3	78·9	79·4	·71	83·3		
..	6	·882	83·2	83·5	79·1	79·4	·73	83·5	Rain.	
..	..	29·909	84·9	85·2	79·3	79·7	29·731	85·2	o	Mean.

ERRATA.

The proof-sheets of the first article not having been submitted to the author, either when the paper first issued from the press, or when it was re-printed, some errors in it require to be corrected. The Sanscrit words have not the long vowel marks, but this most readers will be able to correct for themselves.

Page 2, line 24, *et passim, for* "Bokhars," *read* "Bakhars,"
„ 3, „ 3, *et passim, for* "Bandho Vishnavas." *read* "Baudho-Vaishnavas."
„ 3, „ 19, *for* "Nama;" *read* "Náma;"
„ 3, „ 25, *et passim, for* "Abhanys." *read* "Abhangs."
„ 3, in note, *for* "Pundarekaby," *read* "Pundarika,"
„ 5, line 5, the three first words should be joined to line 4.
„ 5, „ 6, *omit* "who"
„ 5, „ 24, *read,* "Sopándeva and Nivritti"
„ 5, „ 29, *for* "Salea" *read* "S'aka"
„ 7, „ 2, *for* "mothers" *read* "mother"
„ 8, „ 2, *for* "Kaber" *read* "Kabír"
„ 8, „ 3 of the Maráthi, *for* "चीन" *read* "चोन"
„ 9, „ 1, *for* "Shoka," *read* "S'loka,"
„ 9, „ 22, *for* "Bolaji *read* "Báláji"
„ 9, „ 33, *for* "Mamkesvar," *read* "Mánikes'var,"

JOURNAL

OF THE

BOMBAY

BRANCH ROYAL ASIATIC SOCIETY.

OCTOBER—1841.

ART. I.—*The Dowry received by Kashivan.—An Extract from the Rig-Veda, illustrative of the state of Hindu Society, twelve centuries before the Christian Era.—By the Rev.* DR. STEVENSON.

IT is a singular fact in the philosophy of the human mind, that nations have turned their attention almost to every branch of literature before they have engaged in historical researches. Accordingly we find in Greece, that heroic poetry had been brought to its highest perfection by Homer, tragic by Æschylus, and lyric by Sappho and Anacreon; that legislation had been carried as far as ever it was carried in the ancient world, by Lycurgus and Solon; and that Thales, Anaximander, and Pythagorus had founded schools of Philosophy before Herodotus the father of History arose. Had the progress of the human mind met with a sudden check in Greece, before the first of historians had conceived the idea of his immortal work,—had the Persian expedition, for example, succeeded, and Grecian liberty been nipped in the bud, it is extremely probable that we should never have had a Grecian history. It was the exciting and glorious events connected with the repulsion of the Persian hosts, poured by their Monarchs into Greece, which fired the breast of the patriot Ionian historian. Had that war terminated differently, had Greece become a province of Persia—as it afterwards became of Turkey,—would Herodotus have been moved by a like ardour to open up the hitherto untrodden path of History, in order that he might record

the triumphs of the barbaric spoiler of the land of liberty? Or had he recorded them, would his history have won the plaudits of universal Greece assembled at Olympus, and been handed down with exultation and pride to an admiring posterity? But with all the great names we have already mentioned, and many others of kindred fame, the literature of Greece could not have been held in contempt, though she had never produced a single historian. The case which we have supposed in regard to Greece, and which there happily is but a supposition, is what has actually in a great measure taken place in reference to India. The Brachmano-Indian tribes, had certainly in very early times made great attainments in literature and the arts, but were soon checked in their progress towards higher degrees of perfection by foreign invasions, internal dissensions, and above all by a short-sighted system of civilization which narrowed the field for the action of genius, and cramped the powers of the mind by drawing too strong a line of demarcation between the different grades of society. Nothing then which can be considered as possessing the least claim to the designation of history, has been handed down to us by the Hindus from the ages that preceded the Christian era, nor many succeeding centuries. It is in their national literature, therefore, that we must trace their mental developement, and the history of Society among them. While studying with this object in view some of the ancient writings of the Brahmans, I lately fell in with a curious fragment, an unpublished portion of the Rig-Veda, which seems to me to throw a good deal of light on the state of Indian Society at the time that it was written. The author, Kakshivan, son of the sage Dirghatamas—whose relation to the king of Kalinga is mentioned in the eighth chapter of the 4th book of the Vishnu Puran, as translated by Professor Wilson,—was the fifteenth person in descent from the patriarch Pururavas. Parasurama, the great defender of the Brahmans, was the fourteenth in descent from the same Patriarch, by another branch of the family. He—according to Bentley's Hindu Astronomy—lived about twelve centuries before the christian era, and consequently our author must have flourished about the same period or a little later.

The extract referred to is as follows:—

1.—"I fill up with all my heart the measure of no common praise to the son of Bhavavya, who dwells in the land of Sindhu, who has enabled me to perform a thousand moon-plant sacrifices; who is indestructible, and desirous of deathless fame.

2.—I Kakshivan, have lately received from the glorious bounteous sovereign, who requests our blessing, a hundred golden Nishkas, a hundred swift running horses, and a hundred bulls, and have, in consequence, spread his deathless fame throughout the heavens.

3.—The ten chariots conveying as many wives, and drawn by dark bay horses, given by Svanaya, and stationed close by, with a thousand and sixty cows, I, Kakshivan, have brought home before the decline of the same day, in which I received them.

4.—The forty bays yoked to the ten chariots lead the way, at the head of the herd of a thousand cattle, and the well girt attendants steadily bring along the road the horses that convey the gold.

5.—O! my beloved brothers who are desirous of renown, and have collected around me with your cars conveying the moon-plants like a crowd of merchants, all the aforesaid donation I have accepted for your benefit, in all its particulars, with the eleven yoked chariots and a herd of cows worthy of the gods."

1.—From this extract it appears that there was no distinction of caste at the time it was written between the Brahminical and Regal or Kshatriya families. Kakshivan, it appears from the context, was the son of Usik an Kshatriya female, and Dirghatamas a Brahman, and his wives are all of the same description as his mother, and yet he is one of the great Rishis of the Vedas. From the Vishnu Puran also it appears that nothing was more common than such intermarriages. Parasurama himself, the great defender of the Brahmans, was born of an Kshatriya mother. Several even of the Brahminical family are clearly traceable up to Kshatriya ancestors: thus according to the Vishnu Puran, the famous Angirasa Brahmans were descended partly from King Rathinara, and partly from King Harita. The equally famous Kanvayana Brahmans are lineal descendents of King Puru. Kanva was the son of Apratiratha a younger son of Rantinara, and adopted the Brahminical profession while the descendants of Tansu, the elder branch of the family, continued to exercise the sovereignty:—just as in some of the principalities in Europe the eldest son succeeds his father in the Government, while some of the younger members of the family enter the Church. It was not till a later period, and after a long struggle, that particular families usurped to themselves the sole privilege of being considered Brahminical.

2.—We see from this extract, that at the time in question the Hindus

were chiefly a pastoral people. If it is not a narrative of facts, the author must at least have paid some attention to probability, in reference to the state of society in the age in which he lived. Had then there been any general cultivation of the soil, in what one place were a thousand and sixty cows to find pasturage? Besides, while we have a hundred breed bulls, and a hundred horses for the chariots and attendants, we have no oxen for plowing the fields, nor any provision for the purposes of agriculture. There are ten chariots for the ten ladies, but one conveys all their wardrobe, and provisions apparently for the whole company. Owing to the changes that have taken place in the Nishka it is impossible to say with much certainty what its true value was. The weight called Nishka is equal to four Mashas, and most probably that weight of gold was the original golden Nishka here mentioned. If so, the whole sum of money given did not exceed five hundred rupees: but even supposing it to have been treble that sum, and the Nishka equal to a Suverna, this was but a small sum of money when compared with twelve hundred head of cattle, and a hundred horses. Gold, then, it is to be inferred, could not have been very plentiful. Flocks of sheep were either in no account, and thought unworthy of forming a part of a royal donation, or they were not so abundant as herds of cattle. Indeed, in the context when the author requires to refer to the sheep or the goat for a simile, he speaks of the flocks of Gandhara—probably the modern Candahar.

In conformity with this view of the subject it may be worth while observing, that the concluding prayer of the first part of the Sama Veda is—"O Savita, upholder of all things, give us for our portion the possession of cows and horses;"—implying that wealth then mainly consisted in the possession of these.

3.—We observe that at this period daughters were not given in marriage till they were grown up. This is fairly inferrible from the circumstance of the wives of Kakshivan being immediately sent home with him, and the fact that they were grown up is expressly stated in the context; shewing that in this respect also, as well as in the institution of the rules of caste, the Brahminical Hindus have departed from the custom of the first founders of their nation.

4.—I may farther observe, that this extract proves the point that the Rishis are the real authors of the hymns of the Vedas, and not the mere channels by which they have been transmitted, as usually asserted by

modern Brahmans. In this Epithalmium, Kakshivan, without the least hesitation, mentions in the text his own name, and that of his father-in-law; plainly declaring himself to be the author of this eulogy on royal beneficence.

5.—It appears farther from this passage, that an intoxicating beverage was used in the most sacred rites of the ancient Brahmans. The moon-plant sacrifice here mentioned, and at which the hymns of the Sama Veda are chanted, is the most sacred of all the Brahminical rites. It has different names, owing to lesser differences in the manner of its performance, but it cannot take place without a liquor produced by the fermentation of barley mixed with water, and the juice of the acid Asclepias or moon-plant. This liquor is decidedly inebriating in larger quantities, and exhilarating in smaller. It is called in one place of the Sama Veda "the intoxicator of the divine sage Sukra,"* and often mentioned as exhilarating. It is said "to twine around the flame of the sacrifice"†—shewing it be inflammable and to contain alcohol.

I perhaps ought to apologize to the Society for the brevity and other imperfections of this paper, but as they have now got both a Magazine and a Museum in which to store up every thing valuable, however small, that comes in the way of any one, I have felt the more emboldened to present this small piece of antiquity for their acceptance.

II.—*Inscriptions from Palitana—Communicated by Capt.* Le Grand Jacob.

Palitana is one of the five holy places of the Jains, the other four being, Arbudha, Girnar, Samel-sikra in Behar, and Chandragir in the Himalaya. A very distant antiquity is assigned to these temples by Colonel Todd, on the authority of local traditions and a Mahatma which he procured on the spot. But all monumental evidence to their ancient history has possibly been destroyed in the rivalry of two opposed sects, whose cause has been espoused alternately by different Rajahs, who have each annihilated whatever might support the cause of their rivals; and thus all records of remote date have been effaced. Or more probably this absence of ancient inscriptions is owing to "the buildings being chiefly of free stone, the decomposed surface of which

* Sama Veda, Part I, Prapathaka IV, Dasati 6, line 3. For the legend of Sukra's intoxication, and drinking the ashes of his Son-in-law, see Matsya Puraun.

† Sama Veda, Part I, Prapathaka VI, Dasati 8, line 4.

peels off, to the destruction of inscriptions, though these are most frequently engraved on tablets of compact limestone or basalt."*

The following inscriptions will connect the history of the temple from A. D. 1526-27 to A. D. 1596-97. They were taken from apparently the most ancient temples on the hill, and are on the right and left of the entrance.

The second inscription is peculiarly interesting, as contributing much to the history of Akbar's attempt to raise a new religion on the basis of a toleration of all existent religions. General Kennedy, in introducing this important fact to the notice of oriental historians (see *Bombay Literary Transactions*, Vol. 2), does not seem to have been aware of the information which may be gathered on this subject from the Jesuit writers. The toleration, protection, and even support which these missionaries then found in the Moghul Court, and their own misconceptions of Akbar's patronage, form so complete a parallel with the substance of this inscription, that the publication of it must throw much light on an obscure but most interesting portion of Indian History.

The two last inscriptions are in so bombastic a style, that it was difficult to translate them so as to be intelligible and at the same time to preserve at all the character of the originals. A. B. O.

No. 1.—*Translation of the Inscription on Stone on the most ancient of the Palitana temples.—By Captain Le Grand Jacob.*

The manner of constructing the temple of the great and ever to be praised Adeswurjee is here exactly written—He is our God, and the Master of all things.

This temple was begun in the reign of Buhadoorshah, Son of Mahmood Shah, King of Goojrat, in the year Sumvud 1582, by Dosee Kur-
A. D. ma Sha, the Agent of Mujad Khan, Dewan of the King-
1526-27. dom. The *Sutrooŋjyu Hill* is also called Chiturkot Narnor. It is necessary to record that the temple of Adeswurjee will be constructed altogether 16 different times: this of Dosee Kurma Sha is the 7th. Question—where is it erected? Answer—on the Palitana Hill by one strong in the Jain faith, and for the ornament of the sacred mountain.

Throughout Goojrat, and in the opinion of all persons of consequence, this hill is the choicest of all hills; whoever offers up his prayers upon it will be supremely happy and prosperous; its trees are like the Kul-

* Todd's Western India.

puwrksh, and it resembles the golden hill of Meroo; indeed it is the best of all spots for a temple of the Jains: every one who sees it becomes delighted, and he that dwells there has all his sins pardoned. The Raja of the hill was Sree Koomb'hajee, who was a mighty man, and like Agusht Rooshee, who was born from Koomb'h, and who swallowed up the ocean, so this Rajah devoured all his enemies. His son Sungma Sing was victorious in war—his grandson Rajmul was more hardy than any other Raja in battle—Rajmul's son Rutun Sing was worthy of the throne even as a Deu, and brave as a Lion. In his reign lived the founder of the temple.

Account of the Family of Dosee Kurmah Sha.

On the hill of Gopaha resided a Jutee named Bupb'hut, who had retired from the world for the purpose of penance and devotion; thither went Dosee Kurma Sha with his wife: the Ascetic instructed them in wisdom, and convinced him that money and even life were things of no moment—all his race were persons of renown and chastity. His Pedigree is as follows—Surundew's son was Ramdew and his Lak'ha, his son was B'huwunpal and his K'hetoo, who was the father of Nursing who had two wives, Turadew of noble birth and Leloo very religious; their descendants were all prosperous; the first son named Rutun Uksh was worth 100 crores of Rupees, he resided at Shee Chiturkot, his wife was extremely virtuous, and he had two sons, Manuk and Heera; the third brother's wife was a treasure of wisdom, she had one son; the fourth brother was named Dusrut, whose wife was full of faith and devotion, their son was named Kelar; another brother was named Bhoj, whose wife was universally accomplished, their son was Madunjee, endowed with a patient disposition, penetrating intellect, and sound wisdom; he had one sister named Veera: Dosee Kurma Sha's first wife was Kupoor Devee, and second Kumat de; his son was named Soorijee Purbhakur. Such is the pedigree of Dosee Kurma Sha:—now is to be recorded the consecration of the Lord of the Jain faith. In the reign of Sree Rajah Ruttun Sing, gifts were distributed and honors paid to holy men agreeably to the Shastres—Sree Dosee Kurma Sha was much beloved by the Raja. Whoever will listen to the account of the Chitturkot hill will have all his sins pardoned. He obtained by his wisdom, honor from the King and from all the numerous learned men of Goojrat: his Patron, the Dewan Mujad Khan, was as brave as the Lion

of the wilderness: in his service he obtained much honor and wealth: he came to Palitana to erect the temple of Adeswurjee as a place of refuge for all the brave and the good of the earth, with great pomp and festivity, dancing and singing, according to the instruction of his spiritual guide, with the melody of various instruments—the chureh, the chung and mirdung, the meree, the weena, the wasna, the nalruchna and the soorta; every body being dressed in their best attire of their clothes and jewellery, elephants, horses, carriages, palkees, all joining in procession: thus at an auspicious moment on Thursday 6th, of the dark half of Wuesakh, in the era of King Vikramajeet, 1587, the consecration of the shadow of Adeswurjee took place. All the great, learned and holy Pundits, and the most intelligent men of the assembly aided in the 7th consecration of this temple. Thus in the Kulyoog epoch, this temple was erected the 7th time by permission of the King, that every one of the Jain faith might, by coming to Palitana, obtain happiness for his soul. May the family of Dosee Kurma Sha be ever happy and prosperous; such a work as that he has performed was never before done or ever will be; since though under Mahommedan rule still the force and weight of his character gratified both King and people, and thus the consecration of the temple was permitted. The fame of Dosee Kurma Sha, inhabitant of Chitturkot, is spread throughout the world as the full moon shines over the earth; the various bands of Pilgrims who visit Palitana are filled with delight at the view.

No. 2.—*Translated by A. B. Orlebar, assisted by Venayaka Shastra.*

SALUTATION TO OM.

1.—May they who are fortunate and wise, and may ye also be blessed by the most excellent first of princes, the son of Marudeva the crocodile of the sea of pleasures, who expandeth the lotus like the sun by his rays received on the water born plant in greater and greater power as he ascendeth higher and higher in the firmament; who, happy in his many conquests, hath become Omnipotent.

2.—May ye be blessed by him who loveth his lotus birth in the water of the hero family of Siddhatha, who is the mansion of glorious light, the prince Vardaman; whose words were swollen with sweetness as they declared the nature of birth, life and death, as they purified the world, and like the Ganges even an asylum for devotion.

3.—As the moon rising from the sea, so from his chair was the

blessed Sudama, a treasury of great wealth, whose feet are worshipped by crowds of the children of Vasu. And his (spiritual) children, like the voice of the deified Viraprabhu, happy in ennobled joy, support his glory even to this day.

4.—After him were the two priests saint Susbhita and Supratibudhapata; whose disciples, like the light of the sun and moon, were in this world named Kautikians.

5.—Among them was the holy Ganadivipa Saint Vajra, reverenced by the Vajrians, the root of the Vajri branch as the Himalaya of the Ganges.

6.—In his chair as the pearl of day in heaven arose the teacher Saint Vajrasena; and his disciples were Naga, Indra, Chandravrita and Vidiadhara.

7.—From these were born four families, named after each of them, and amongst them the Chandra family pre-eminently shone.

8.—Among these were born many who were honourable in the world, and like suns dispersed the proud darkness.

9.—Among them there followed in succession the sainted Sagatchandra Suris, by whom the bracelet of religion was assumed in the year 1285.

10.—Next in the same Gun followed the Hemavimala Suris, and in their chair came the Anandavimala.

11.—In the year 1582 a felicitous dwelling for the pure practice of religion was happily erected for the sake of the (right) way on account of the relaxation (of discipline) by the famed Moon-race, swelling with sweetness like the clouds which, utterly expelling the heat, again restore pleasure to the earth.

12.—Their chair delighted the minds of men, by the rise of the lotus, and was adorned by the lotus-sitter, Vyiya Dana, and Munisha, as the stream of the river of the Immortal Gods by the Swans.

13.—And when their felicity which robbed Hari of all his pride, their beauty more excellent than that of Kumbha's husband, and their warmth which was stolen from the friend of the hundred-petalled flower, were seen for many days by Madhuripu, by the Lord of Heaven, and the warm-beamed One; they three overburdened with the greatness of the shame turned milk-sellers.

14.—By the benevolent friends of Huvivijaya, the prince of great men, their pulpit was covered with a roof and also was floored with beautiful chunam; it became the support of the felicity of those who

are great in the fulness of light and most glorious. It was a place most beautiful to behold.

15.—The mighty Suris were honorably summoned by the fortunate Shah Akbar from Goozerat. And they came to the beauteous land called Mevut, bearing lotus flowers in their hands, and dispelling from the senses as suns from the heaven all darkness from the senses in the crowds (of hearers), expanding like the all beauteous lotuses.

16.—They exalted Futepoor above the earth of present joys, to heaven's height, filling with lovers' joys the eyes of many a Swan in the year 1639; for truly they bore in their hands a forest of lotus flowers.

17.—He whose commands were as garlands on the heads of princes, the blessed heroic Emperor Akbar, the destroyer of sin, proclaimed by beat of the great drum a truce of six months in all lands. For delighted was his heart, when gladdened by the words of that (holy man.)

18.—Through his counsel, the Emperor Akbar, loving his courtiers, remitted the right of heirship, the tax, and the Sujij.

19.—With a mind free from fear through his exhortations, as a flood of water cleansed from mud by the Strychnos Potatorum, the merciful emperor, who ever embraced the righteous laws of Government as a dear wife, remitted the taxes, which other kings of the earth cannot remit, for the love of their people. He released also bulls and oxen, and birds and slaves.

20.—Gladdened by his eloquent language, in comparison of which ambrosia is but vanity, the blessed Akbar, Emperor of the world, with a heart full of joy, after remitting the taxes both in kind and money, gave to the Jains for their love sake, that beautiful tirth, the mountain Shatrunjaya.

21.—Rejoiced by his discourse, he with a wise and kind heart made a library full of learning, like the dwelling of the Goddess of speech. Anxious to comply with his zeal, the emperor, in his pure mind, continually regarded the presence of the Saints as a great subject of rejoicing.

22.—The mind of the impartial lotus like moon, the emperor Akbar, being expanded by his discourse, as the mud-born plant by the light of the sun, the emperor became celebrated by the good and perfect mendicant priests throughout all lands, as having a loving mind to the Arhats, even as Saint Shrenika, ruler of the earth.

23.—At the exhortation of the Saint, even the robber Meghaji ceased his perverseness, worshipped his feet daily, as the bee does the lotus flower. Many with delight at his words, which guide to placidness and pleasure, forsook their old principles and took on themselves the name of religion.

24.—At his preaching in Guzerat and in other lands, in the famous Kshetras, wealth was profusely expended in building. And on Shatrunjaya mountain, the holy men with the assistance of crowds of people from Guzerat and Mewat, and Mahrashatra erected a Pash.

25.—The all enlightened Vijaya sena nunindra chundramas, (or Vijaya sená, the moon of the lords of Memis) triumphs—the friend of the opening night lotus who expelled the thick darkness by many words, and made his pulpit as the placid sea.

26.—What can be said more to the praise of his glory than that he threw the bragsters into a dreamless sleep even while alive.

27.—The lotus-born Prince had taken prosperity from the uneven weaponed, splendour from the husband of the Lotus, glory from the husband of the mountain Goddess, the brightness of his full orb from the husband of the Nymphia esculenta, the might of sacrificial fires from the earth's support, profundity from the treasury of waters, and so had he given them his body.

28.—And they by holy Akbar having been graciously and hospitably invited to holy Mullabhapoor Purander, accompanied by multitudes of deities, holy and wise, adorned the city, as playful swans adorn the honied sweet-smelling lotus-forest.

29.—Openly in the court of holy Akbar they shewed the most excellent Arhat to be the Almighty God, by a multitude of arguments, and the boastful twice-born chieftains were dazzled by the light of the victorious reasoning; as thieves confounded by kings.

30.—In the court of the holy emperor Akbar, they conquered with many evident arguments, the argumentive, as lions conquer the mad elephants, and they erected on the north side a holy high pillar bright as Keilas, to gratify the desires of the all-wise.

31.—That which was given in the presence of the fearless Harivijaya and royal priests by the holy Emperor Akbar, the Prince of the earth, was for the love of him. By his man-like mind was all that done to which let the earth be witness. That letter termed a firman has been in holy manner promulgated in every quarter.

32.—Moreover (in it was written) that cows and bulls and buffaloes, both male and female, should never be led to the house of death; that the whole tax upon the dead should be remitted, and that slaves should on no pretence be made.

33.—All these benefits were graciously conferred for the joy of his people by Akbar, the Lord of the world, whose mind was a tree which drank from the bright cloud of his glory.

34.—Honored by the son of Chote Begum, the Supreme Lord of the world, happy in the overflow of purity, felicitous in the full expansion of the flowers of virtues, they make the mighty plain of Guzerat ever a source of ennoblement to its inhabitants, and the dwelling place of glory; as garlands on the necks of lotus-eyed damsels.

No. 3.—*Translated by Ball Gungadhur Shastri.*

Further there was a Goldsmith Sreshti Shri Shewraja, in the Ukesa race, the lotus of the Abhur line and of virtuous mind. His son was Sindhar? whose son was Parvatta, whose son was Kâla, from whom descended Vagha. His son was the illustrious Bali born by Rajai. He had a consort by name Suhasini, as Pudmapati* has Padma—Tejapal was the offspring of this pair, as Iaija is of Indrani and the lord of the Suras, delighting Sumanas,† and pleasing the minds of his parents. As Kam (Cupid) has Rati for his consort, Hari has Rama, and the lord of Gouri (Mahadeo,) has Gouri, so he had Tejaladu, whose form was the most beautiful. This couple shone by the lustre of enjoyments, evinced great attachment to their Gourie, and paid honor to Suparwas ‡ like Papalomi (the life of Indra) and the lord of the Tridashas. Having his mind exalted with piety by the nectar nullifying instructions of Vijaya Sana, the chief of the Munis, who was a full moon over the ocean of resignation, an elephant among the devotees of Bahir Vijaya? and who shone by the lustre of good fortune and prosperity, he (Bali) became attached to those acts which are dear to virtuous men, such as congregational worship, pious gifts, and the repair of the temples of Jina. This Tejapala, the Goldsmith, dedicated with great rejoicings the auspicious Suparonva Bharta and Ananta Bharta

* Vishun, as the husband of Padma, which is one of the names of Lachsmi.

† Here is a simile founded upon a play of words that cannot be translated.—The son of Indra delights the Sumanas or Gods, while the Prince delights the learned men, which is another meaning of the word.

‡ Here is another untranslatable play upon the word Suparva. In the case of Indra and Indrani it signifies the inferior Gods, but in that of the king and his wife it means festivals or Holy days.

in the year 1646, on a day on which the planets were favourable, He first constructed the temple glittering with precious stones, gold &c., affording pleasure to the sight. Here also others willing to turn the wealth acquired by their arms to good use erected temples in succession ? * At this holy place, an opulent man by name Sadhu Karama constructed a temple in the year 1588 to Mumraja, purified by delight. Seeing the Vihara (temple) of Bhagavan old, Tejapala conceived in his mind as follows---When will that good time arrive, when this temple will be renewed. Next day that good merchant, while living in the excellent and holy town of Shree Stambha, had his heart enlightened by the advice of his preceptor; and desiring to make a good use of his wealth he fully made up his mind to construct a Gate to the temple of Arhat (Budha) on the auspicious place Shatrunjaya, which is the principal of all great places of sanctity, considering that virtuous acts done there contributed to happiness and prosperity of men, that virtuous man, for securing great bliss and delight to the line of his ancestors caused repairs to be made to the old temple of Arhat in the most hallowed Tirtha of Vemalachala ?

This temple pierces the celestial vault by its steeple, its pinnacle glows with golden goblets ? With a height of 52 cubits, with no mean pride it ascends to conquer the grandeur of the heavens. In this dwelling place of the Arhat there glitter 1245 goblets which surpass the cheeks of the elephant of gods (Airavata) as so many suns in varied forms overcome by the exceeding glory of the lord and reduced to be his slaves. In this abode of Jina, there are 21 lions collected as if to signify they were ready to destroy at once all the obstacles, which, like elephants, have rooted out the tree of happiness in this world, where four Yoginis adorn the Jina's house as if four points of the compass subdued by his prowess had assembled to serve him—Where also (eight) Dikpalas are resplendent as if the virtues of the ascetics had assumed forms and were in attendance. Seventy two orbs of the moon of Jiendra adorned the Deve—Kalika (?) As if the buds of seventy two creepers, round which the dependants of Jina are hovering about like black-bees, were filling the world with their perfumes.

In this house of Jina there are four handsome windows like the mouths of Virinchi (Brahma) for the creation of the Universe. In which temple there are four ascetics, as if deities had assumed a form and had come to visit the Lord's House. In this house of Jinendra,

* Here one Shloka seems wanting.

there shine thirty two female figures, whose forms surpass that of Indra's Mistresses; and who as it were, are the queens of kings, that have recognized the Jina as their Lord by his characteristics? There are also thirty two excellent artificial and encaanting portals—methinks they are the grand and handsome looking swings of the antelope-eyed beauty of the teeth of the founder of this holy place. In this house of Jina shine 24 elephants of the height of mountains, as if twenty four forests had assumed the shape of Elephants and had come to pay their devotions to the Lord. As if Indra, with the lords of the different points of the compass, had come to pay their devotions to their benefactor; there are seventy-four pillars to this temple of Jinedra as high as the Lord of the mountains. This noble edifice of great delight was constructed in the year 1649, by the assistance of Jasu Thakur, and a clever mason, called Rama, by the virtuous and noble-minded son of Balica on Shatrunjaya. Seeing this building which is compared to the temple on the holy place, Ashtapada, whose mind would refrain from experiencing joy! may this temple? Standing on the hill of Shatrunjaya, called Nandivurdhan, like the house of four virtuous Lords of the Earth, which has delighted the whole universe, ever afford you the objects of your wishes. Knowing the great expenditure of wealth in the construction of this temple, which always cools the eye by its column of lustre, men say that by this expenditure Tejapala has exhausted the treasures of the desire-yielding tree.

Tejapala made a pilgrimage for virtue in the year 1650 to Shatruujaya; and he caused the preceptor, the lion of learned men, called Bahirvijaya, to consecrate the temple on an auspicious day. As a crowd of lotuses is delighted to see the orb of the sun, as the current of the great watery basin is transported with joy to observe the luminary with nectar beams, or as a flock of Peacocks is overjoyed when it beholds a very high cloud, so are all delighted on beholding this temple. A temple with four entrances was constructed by Shriramaji to afford delight; a second, high and noble was built by Jasu Thakur; a third temple, a handsome one, was the work of Kunjaraji; and the fourth, which is the most beautiful, is made by Mula Shrishreshthi. May this edifice, attended by four temples on Shatrunjaya, and having its beauty blended with these columns of light pervading the universe, long remain happy like Indra attended by the lords of the celestial regions (?)

This specimen of the skill of the excellent carpenter, by name Vasta, should be particularly and often visited, being the work of an artificer under whom Vishvakarma, though skilled in the craft, wishes to be a pupil, in order to become celebrated in architecture. May this elegant eulogy, full as it is of figures, like a woman embellished with ornaments, composed by Hamavijaya, a black bee on the lotus-like feet of Kamalavijaya, of acute mind and of virtuous course of life. Thus is the eulogy on the Adisha Mula Prasada, an ornament to Vimalachala, constructed by Tejapala, the Saha of Sauvarnicas—happiness.—Kiraya Jayœ Sagarœ, one of the oceans of innate wisdom, wrote this, and it was engraved by the sculptors Mahadev and Nana.

III.—*Climate of Nagpore.*

In the Journal of the Asiatic Society of Bengal for 1833, there are two interesting papers on the Climate of Nagpore;—the first by Dr. Geddes, of the Madras Army, the other from the pen of the Secretary Mr. James Prinsep, in whose hands Dr. Wylie, now Superintending Surgeon at Madras, had placed the copious Repisters kept by himself and Captain Lloyd (of the Bombay Artillery) between the years 1820 and 1830. The latitude of Nagpore is about 21° 10′ N., and the longitude 79° 15′ E.; it therefore forms a good intermediate station with which the observations at Calcutta, Madras and Bombay may be compared; and from its importance as the capital of the Berar state, and its connection with the great inland districts in which much of the Cotton exported from Bombay is grown, every observation on its climate, especially on the quantity and distribution of rain, is of importance. Dr. Ludlow who succeeded Dr. Wylie as Residency surgeon, has favored the Secretary with the following table exhibiting the fall of rain during each season from 1833 to 1840. From November to May hardly any rain falls at Nagpore, and Dr. Ludlow was occasionally absent during these months, and so far the table is imperfect; Mr. Prinsep's table drawn up from Dr. Wylie's and Captain Lloyd's observations, is therefore inserted. It is only necessary to add, that, as might be expected from its geographical position, the barometer at Nagpore has a smaller rise and fall during the year than

that of Calcutta, and a greater than that of Madras; and that the mean annual temperature is as follows:—

At Sunrise in the open air	69.5	From Dr. Geddes's tables.
Minimum Temperature	69.3	by Captain Lloyd.
At 9 A. M. in the House	80.5	by Dr. Wylie.
At noon do	80.3	(Tatty used in last months ?)
At 2 P. M.	81.1	by Dr. Geddes.
Maximum Temperature	89.4	by Captain Lloyd.
At 5 P. M...do	84.2	by Dr. Wylie.
At 8 P. M...do	80.2	by Dr. Geddes.
Mean of Maxima	79.2	by Captain Lloyd.
And Minima	82.7	

From the mean of the Maxima and Minima, and from the pair of observations at 9 A. M. and 8 P. M., it may be assumed with tolerable confidence, that the mean temperature of Nagpore does not differ much from 80 Fahr., which is nearly 2 degrees higher than that of Calcutta, and 1½ lower than that of Madras.* By Colonel CULLEN's Barometrical measurements, Asiatic Researches, vol. 18, Nagpore is 900 feet above the level of the sea.

TABLE I.

Fall of rain at Nagpore, registered by Dr. WYLIE.

MONTH.	(Lloyd) 1814–15	1826	1827	1828	1829	1830	1831	1832
January	...	2·30	0·46	0·18	..	...	...	...
February	...	...	0·50	1·21	0·76	...	...	2·98
March	...	...	3·84	0·71	2·49	1·57	...	...
April	...	...	1·01	0·06	0·00	0·68	...	...
May	...	1·10	0·21	1·55	...	1·35	...	...
June	0·23	22·25	6·25	8·37	8·07	8·55	13·78	8·01
July	7·08	12·00	14·93	9·33	15·94	7·10	7·22	14·49
August	14·72	18·50	7·51	9·07	7·89	7·00	14·58	3·46
September	7·36	8·13	16·32	9·40	6·32	4·78	11·98	7·77
October	2·97	0·04	0·00	6·40	8·22	1·98	7·24	...
November	0·45	1·31	2·88	0·20	...	...	2·27	...
December	...	...	0·13	...	0·50	...	8·24	...
Annual Total...	32·81	65·61	53·99	46·61	50·25	33·00	65·31	37·14
In the Monsoon....	32·30	62·00	45·22	44·18	46·44	30·75	54·80	33·73

Average of 8 Years.....48·10 inches.

* Journal of the Asiatic Society of Bengal, note 2d. p. 546.

Register of the Pluviometer kept at Nagpore by H. C. Ludlow, M. D., Residency Surgeon.

	1833		1834		1835		1836		1837		1838		1839		1840	
Feby.	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
26	...	...	...	0·20												
Total.	...	...	...	0·20												
April																
2	...	...	0·49	0·36												
	...	...	...	0·49												
Total.	...	...	...	0·85												
May																
12	...	0·80														
14	...	0·30														
18	...	0·2														
20	...	...	...	0·4												
21	...	...	...	1·78												
27	...	0·3	...	18												
31	...	...	...	...	...	...	...	...	...	...	...	...	...	1·16		
Total.	...	1·15	...	2·00	...	...	...	...	...	...	...	...	...	1·16		

	1833		1834		1835		1836		1837		1838		1839		1840	
June	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
1	..	...	...	...	0·40	0·32	...	..	...	...	...	...	...	...		
2	...	..	..	..	0·03	...	...	...	...	...	...	...	0·92	...		
3	..	..	...	0·02	...	..	...	..	...	...	...	...	...	...		
4	..	..	..	..	0·30	0·12	...	..	..	...	...	1·10	...	...		
5	...	...	...	...	...	...	...	...	...	...	0·08	...	...	0·56		
6	...	...	..	0·15	...	...	0·48	..	..	...	...	...	...	1·23	...	0·17
7	..	..	...	...	..	0·05	...	0·05	..	...	...	...	0·76	0·59	...	...
8	.	..	...	..	...	0·04	0·05	0·03	..	...	...	...	...	...	...	...
9	...	...	...	..	...	0·13	0·26	0·14	...	...	...	...	...	...	...	...
10	...	..	...	...	..	..	...	...	...	...	...	...	...	...	...	...
11	...	...	0·53	1·10	...	...	..	0·11	...	...	...	0·25	...	...	...	2·74
12	..	...	0·06	...	0·13	..	0·80	...	..	...	0·29	...	...	...	...	1·52
13	...	...	...	·10	...	...	..	..	..	...	0·30	...	...	...	...	...
14	...	0·07	0·15	2·93	03	...	...	0·16	...	...	...	...	...	...	0·14	0·12
15	..	..	...	0·08	...	1·15	0·03	0·06	...	...	...	...	...	...	...	0·74
16	..	...	0·10	...	0·06	·4	0·05	...	...	...	...	...	...	...	...	0·11
17	...	...	0·06	0·53	..	·80	0·10	0·11	...	...	0·00	0·11	...	...	...	1·89
18	...	..	...	...	0·15	·10	1·40	·22	...	...	...	...	...	...	...	...
19	..	...	...	..	0·40	...	...	0·06	..	...	...	1·45	...	...	0·14	0·78
20	...	..	0·06	...	...	...	...	...	...	...	0·33	...	...	...	...	0·02
21	...	...	...	1·08	..	..	1·20	0·05	..	...	0·03	0·22	...	...	...	...
22	...	·13	0·14	...	..	...	...	..	0·78	0·05	0·06	0·04	...	...	...	...
23	..	·5	1·34	...	0·06	0·30	...	.	..	...	...	...	...	...	...	...
24	...	...	..	...	0·30	..	0·06	0·35	..	...	0·31	...	...	...	...	...
25	...	...	...	..	...	...	..	..	...	...	...	0·25	...	...	...	...
26	..	0·22	..	...	..	...	0·11	..	...	...	0·78	0·39	...	...	...	...
27	...	...	...	...	...	·12	..	0·30	...	...	0·06	0·74	0·58	...	...	...
28	...	...	0·08	...	..	..	0·04	...	0·04	...	...	0·19	...	...	...	...
29	0·21	...	2·82	1·03	..	...	...	..	·27	...	0·60	0·32	1·27	...	...	...
30	...	...	...	·52	...	...	..	0·30	..	...	0·70	0·86	...	...	...	...
	0·21	0·47	5·34	7·54	1·86	3·17	4·58	1·94	1·9	0·05	4·44	5·92	3·53	2·41	0·28	6·57
		0·21	..	5·34	...	1·86	...	4·58	...	1·9	...	4·44	...	3·53	...	0·28
Total.		0·68	...	12·88	..	5·03	..	6·52	...	1·14	...	10·36	...	5·94	...	6·85

	1833		1834		1835		1836		1837		1838		1839		1840	
July	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
1	0·35	...	1·54	0·18	...	...	0·20	0·4	...	...	...	...	...	...	...	...
2	...	...	0·08	...	...	...	...	...	...	0·04	...	...	...	...	...	...
3	...	...	...	...	...	...	...	...	...	0·87	...	...	...	...	...	...
4	...	...	...	0·58	...	...	...	...	0·29	...	...	...	0·60	...	1·17	...
5	0·25	...	1·28	0·58	...	...	...	...	1·3	...	...	...	...	...	0·13	...
6	...	0·03	0·13	0·32	...	0·20	...	...	...	3·42	...	...	...	1·27	0·11	...
7	...	...	·14	1·2	·4	...	...	0·93	...	0·58	...	...	...	2·70	0·69	0·97
8	...	...	...	...	...	...	0·28	0·23	...	0·68	...	...	1·07	...	2·42	0·54
9	...	...	...	...	·3	...	0·11	0·12	...	...	...	...	...	0·24	...	...
10	...	...	0·18	...	...	...	...	1·45	0·24	...	...	...	...	0·85	...	...
11	0·19	2·47	...	...	...	...	0·05	...	...	...	...	...	0·57	0·70	0·97	2·12
12	...	5·50	0·58	0·38	0·18	...	0·60	...	...	...	...	...	1·14	0·28	0·46	0·86
13	0·50	...	0·33	1·22	...	...	0·03	0·10	...	...	...	...	0·60	...	0·51	...
14	...	0·02	0·15	0·14	...	...	...	0·15	...	...	...	...	...	...	...	...
15	0·18	...	2·40	...	...	...	0·26	0·09	...	...	...	1·02	...	...	...	...
16	...	...	...	0·20	0·35	0·08	...	...	...	...	0·70	...	0·29	0·16	...	0·80
17	0·24	...	0·03	0·38	0·52	...	0·07	0·09	0·20	...	...	...	...	...	0·53	0·11
18	...	...	...	...	0·67	...	...	...	0·75	0·14	...	...	...	...	0·09	...
19	...	...	0·56	0·38	...	0·30	...	...	0·34	0·22	0·33	1·10	...	...	0·14	...
20	0·05	...	...	0·32	...	...	...	...	0·56	...	0·67	0·49	0·57	0·14	...	...
21	0·03	...	...	0·22	...	...	...	...	...	...	...	...	0·26	0·17	...	0·89
22	...	...	0·25	...	...	...	...	...	...	...	...	...	...	0·28	0·41	0·47
23	0·03	...	...	...	...	...	...	...	...	...	...	...	1·18	0·06	0·22	0·33
24	0·011	...	0·42	0·03	...	...	0·06	2·64	...	...	...	...	0·03	1·25	0·18	3·10
25	0·015	1·05	0·05	2·18	...	...	...	...	...	0·25	...	...	2·34	0·37	1·08	0·32
26	0·30	1·78	2·90	0·45	...	...	...	...	0·15	0·95	...	...	0·69	0·04	0·05	0·33
27	0·03	...	...	...	...	...	0·12	0·10	0·54	0·42	...	...	0·02	...	0·03	...
28	...	0·50	...	...	0·12	...	0·14	0·70	0·56	...	...	...	...	...	...	...
29	...	...	0·75	0·45	...	...	0·25	0·3	...	...	...	...	...	0·47	...	...
30	...	0·57	0·15	...	...	...	...	...	...	...	...	0·43	...	...	0·47	0·14
31	0·08	...	...	0·03	0·72	...	0·24	1·32	...	...	0·18	0·06	...	...	...	...
	3·44	11·92	11·92	8·48	2·63	0·8	2·41	8·4	5·57	6·64	1·88	3·10	9·36	8·98	9·69	11·45
	...	3·44	...	11·92	...	2·03	...	2·41	...	5·57	...	1·88	...	9·36	...	9·69
Total	...	15·36	...	20·40	...	3·21	...	10·45	...	12·21	...	4·98	...	18·34	...	21·14

	1833		1834		1835		1836		1837		1838		1839		1840	
Aug.	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
1	0·70	0·12	0·10	...	...	...	0·45	15	...	...	0·90	0·70	...	...	...	1·39
2	...	...	...	0·15	...	...	...	...	..	...	1·16	0·16	...	...	0·06	...
3	...	...	0·38	0·30	...	...	..	..	..	...	0·38	0·07	...	...	...	...
4	...	...	0·03	0·58	...	...	..	..	..	...	...	...	...	...	...	...
5	...	...	0·070	0·20	0·06	...	...	0·18	..	...	0·19	...	...	...	0·08	0·03
6	...	...	0·03	..	0·10	..	..	0·82	..	...	...	...	...	...	1·23	0·82
7	...	...	0·08	...	0·04	...	0·18	0·48	...	...	...	...	...	...	0·07	0·24
8	...	...	...	..	...	...	0·32	0·52	..	...	...	...	...	...	0·03	...
9	...	...	...	...	..	0·08	0·12	...	...	...	...	...	...	0·46	...	...
10	...	...	...	...	...	0·80	0·05	...	1·12	0·52	0·25	0·11	1·30	...	0·11	0·78
11	...	...	...	...	...	...	...	...	...	...	...	...	0·36	0·11	1·57	0·2
12	...	...	...	...	1·12	...	0·40	0·12	..	...	...	...	1·60	...	...	...
13	...	...	...	...	·80	0·10	0·04	0·10	...	1·73	0·03	0·28	...	...	...	...
14	...	0·18	...	...	0·09	...	0·55	...	1·71	...	...	...	...	...	...	...
15	...	0·18	...	...	...	..	..	...	...	...	...	...	...	...	...	...
16	0·10	...	...	...	1·20	...	...	...	...	...	...	...	...	...	...	...
17	...	..	..	...	0·20	0·12	...	0·25	0·31	0·29	...	0·40	...	...	...	...
18	...	...	0·21	1·00	..	0·12	0·03	0·3	0·61	0·51	...	0·93	0·78	0·57	...	...
19	...	...	0·38	.	0·25	...	..	0·20	0·19	0·90	...	...	6·12	...	...	...
20	...	0·03	0·16	...	...	0·12	0·30	·28	..	...	...	...	...	...	...	...

	1833		1834		1835		1836		1837		1838		1839		1840	
Aug.	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
21	...	...	0·32	...	1·56	1·70	...	...	0·21	0·22	...	....	0·80	...	...	...
22	0·60	0·68	0 92	...	0·30	0·10	...	...	0·12	...	...	...	...	...	2·12	0·09
23	1·30	...	0·18	...	0·20	0·32	...	...	...	...	...	...	...	1·57	...	...
24	...	1·30	...	...	0·82	1·90	...	...	...	...	...	...	0·66	0·16	0·62	0·03
25	0·08	...	...	...	0·12	0·72	0·35	0·23	0·18	0·11	...	...	...	...	0·32	0·19
26	...	...	...	1·50	1·13	0·14	...	0·12	...	2·47	...	...	...	...	2·40	0·11
27	...	...	0·12	0·28	0·03	1·4	...	...	4·41	1·98	...	...	...	...	...	...
28	...	...	...	...	...	0·32	...	..	1·3	0·27	...	...	0·08	3·22	...	...
29	...	...	...	...	...	...	...	...	0·14	...	...	...	0·06	...	...	...
30	...	..	...	...	...	0·25	...	..	...	...	...	...	0·08	...	...	...
31	0·03	0·40	0·15	...	...	...	...	...	...	...	...	...	...	...	...	...
	2·81	2·29	3·75	4·1	8·2	7·83	3·39	3·48	9·3	9	2·91	2·74	6·34	6·9	9·21	3·70
	...	2·81	...	3·75	...	8·2	...	3·39	...	9·3	...	2·91	...	6·34	..	9·21
Total.	...	5·10	...	7·76	...	15·85	...	6·87	...	18·3	...	5·65	...	12·43	...	12·91

	1833		1834		1835		1836		1837		1838		1839		1840	
Septr.	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
1	0·03	0·05	...	·70	...	0·48	1·12	...	..	..	..	...	...	...	..	...
2	...	0·03	1·15	0·08	1·65	0·84	0·80	...	0·17	...	..	...	...	...	...	0·03
3	...	...	0·6	0·42	0·10	0·24	0·12	...	0·12	0·21	...	...	...	...	...	0·09
4	0·40	...	1·5	0·62	0·05	...	..	...	..	...	...	...	...	...	0·57	0·24
5	...	...	0·90	0·03	·50	0·16	0·03	...	...	...	...	...	0·53	...	1·48	3·13
6	...	0·42	...	...	·34	0·05	0·06	...	...	...	..	...	0·38	...	0·3	0·03
7	...	...	...	...	0·06	...	...	...	..	..	..	...	...	...	·34	0·39
8	...	0·32	...	...	..	0·04	...	...	...	...	...	...	0·59	...	0·09	..
9	0·32	...	0·16	0·11	0·03	0·092	...	...	...	0·89	...	...	...	·32	...	...
10	...	...	0·34	0·06	0·80	0·064	...	...	0·04	0·06	...	...	...	...	...	...
11	...	...	1·40	...	0·35	0·29	...	...	0·21	1·37	...	...	...	...	0·46	0·31
12	...	...	0·92	...	...	...	...	...	..	...	...	...	0·09	...	1·9	...
13	...	0·14	...	...	·3	...	...	...	0·15	0·49	...	...	1·10	..	..	0·36
14	0·08	...	...	...	...	...	...	...	0·69	...	...	...	...	..	..	1·25
15	..	...	...	...	...	...	...	...	...	..	..	...	1·62	...	0·78	0·51
16	...	...	0·22	0·52	...	...	..	...	0·47	...	...	...	...	...	...	...
17	...	...	0·14	...	2·85	2·14	...	...	...	...	...	...	...	...	0·24	...
18	0·27	0·18	...	...	...	0·35	...	...	...	0·04	...	...	0·13	..	0·06	0·19
19	...	0·30	...	...	...	0·03	...	...	...	0·12	...	...	1·12	..	...	0·26
20	...	...	...	...	0·04	...	...	...	...	0·44	...	...	...	..	1·11	2·45
21	...	...	0·82	0·05	0·05	...	...	...	...	...	...	...	..	..	...	..
22	...	...	..	...	·22	...	...	...	...	...	...	...	...	..	...	...
23	...	...	...	0·08	...	...	...	...	...	...	...	...	...	..	0·34	0·34
24	0·15	1·30	0·32	...	...	...	...	...	...	...	..	...	...	...	..	...
25	0·90	1·20	0·04	...	·10	...	...	...	...	...	...	...	...	...	..	...
26	0·30	2·15	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	0·04	...	...	...	...	...	...	...	...	...	...	...	...	...
28	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
	2·43	6·9	7·56	2·67	7·17	6·18	2·13	...	1·76	3·82	...	...	5·56	·32	6·59	2·58
	...	2·45	...	7·56	...	7·17	...	2·13	...	1·76	..	...	...	5·56	..	6·59
Total.	...	8·54	...	10·23	...	13·35	..	2·13	...	4·58	..	...	...	5·88	...	16·17

	1833		1834		1835		1836		1837		1838		1839		1840	
Octr.	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
5	...	0·12	0·30	·06	...	...	...	...	...	...	...	...	...	...	...	...
6	...	...	0·45	0·30	...	...	...	...	...	...	...	...	...	...	...	...
7	...	....	0·03	...	....	...	...	...	...	...	...	...	...	...	...	...
12	...	....	0·83	...	....	...	...	...	...	...	...	...	...	...	...	...
13	...	....	...	1·12	....	...	...	...	...	...	...	...	...	...	...	...
16	...	....	...	.86	...	...	...	...	...	...	...	...	...	...	...	...
17	....	....	·16	1·92	·40	...	...	...	...	...	...	...	...	...	...	...
27	...	....	...	0·42	...	...	...	...	...	...	...	...	...	...	...	...
28	0·16	....	0·03	0·52	...	...	...	...	...	...	...	...	...	...	...	...
	0·15	0·12	1·80	5·20	0·40	...	...	...	...	...	...	...	...	...	...	...
	....	·15	....	1·80	...	0·40	...	...	...	...	...	...	...	...	...	...
Total.	...	0·27	....	7·00	....	0·40	....	....	...	...	...	...	....	...	....	...

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

IV.—*On the Coral Islands and Coral Banks of the Red Sea, and on the improvement of the knowledge of the organization of small bodies by the aid of the Microscope.—By Professor Ehrenberg.*

The discoveries of Dr. Ehrenberg of Berlin, in the history of Infusoria and the Polythalamia tribes of animals which are only visible with the aid of powerful microscopes; and the astonishing fact brought to light, proved and magnificently illustrated by him, of their remains forming great rock formations in various parts of the world, have delighted the general enquirer, and have elevated the German Naturalist and traveller to a level with the first Philosophers of the age. Mr. Weaver, an eminent English Geologist, has recently given a sketch to these researches, with the view of drawing the attention of English Naturalists to a subject, which "involves no less than an investigation "as to what extent minute organic bodies, invisible to the naked eye, "may have contributed to the production of all limestone formations, "whether of an age posterior or anterior to the chalk, descending thus "to the primary limestones." This sketch he commences by an outline of Dr. Ehrenberg's earlier researches, concerning the Coral tribes in general, and those of the Red Sea in particular, which gave origin to his new views of the structure of the Polythalamia, and of the formation of the rocks in which they abound.

At the instigation of the Royal Academy of Sciences of Berlin, Dr. Ehrenberg visited Egypt, Syria, Arabia, and the Eastern declivities of the Highlands of Abyssinia, in the years 1820 to 1825, and devoted many months to the investigation of the Coral animals of the Red Sea. The results of these researches were given to the world in two papers published by the Berlin Academy in 1833 and 1834. The first entitled "Contributions to the Physiological knowledge of Coral animals in ge-"neral, and in particular of those of the Red Sea, with an attempt to "classify them according to their Physiological distinctions: the 2d "On the nature and structure of the Coral banks of the Red Sea." These works, besides the results of observations made at nearly 150 different points of the Red sea, and descriptions of no less than 110 of its coral animals (or three times the number formerly known,) contain the most important general views, and a critical examination of the labors of former Naturalists.

Many abstracts and sketches of these papers have appeared in English Literary and Scientific Journals, but neither have yet been translated or given in such a way to the English Student, as to enable him to

use them in his own researches. Having, therefore, procured Copies of these papers, and the assistance of a well qualified translator, the Editor thinks that he cannot do a more acceptable service to the cause of Science in India, and especially in Bombay, than to put it into the power of all whose duties carry them to the Red Sea or Persian Gulf, or who reside near our own shores, to read these observations.* On a future occasion he may introduce his readers to the more recent discoveries of the German Professor, on the composition of Chalk rocks and Chalk marl by invisible organic bodies; an investigation founded on these researches on Coralline animals, and on the structure of Egyptian Rocks, and on which the lime-stone of Luckput-bunder in Kutch, and of the hills of Scinde afford the best means of studying and of making new observations. He has, in the mean time, selected the paper on the Coral Islands of the Red Sea, as being of most general interest.

V.—*On the nature and formation of the Coral Islands and Coral Banks in the Red Sea. By C. G. Ehrenberg.*—Read in the *Royal Academy of Sciences of Berlin* on the 22d of March 1832, and revised and printed in February 1834. Translated by Revd. C. Menge.

I. *On the general impressions concerning the life of Coral banks, and the metamorphoses of Corals.*

The natural philosophy, and more particularly the natural history, of Corals, of which the fine red Coral so well known as an ornament is but a single form and the most inconsiderable part, cannot but be extremely interesting; they are reckoned among the most numerous, the most curious, the most unknown, and the most influential forms of organic life. Masses of lime-stone which are produced by them when mixed with layers of shells, sometimes form high ridges of mountains, and sometimes cover the soil to a considerable distance, and their fossil remains serve the attentive Geologist, as marks of the changes and the epochs of the formation of the different parts of the earth. But these remains of Corals which are much admired in Mineralogy, and used for important purposes, are found only in a state of decay, without life and in fragments. Far more interesting do their forms appear to the traveller who touches the coasts of the South-sea, and sees them alive in their dwellings, which extend to enormous distances. There the flower-like animals of the vegetable Coral stems vie in the brilliancy of

* The sea around Bombay itself abounds in Corals, easy of access, and which may be studied in their native habitats by any who walk along the shore of Back-bay at low water.

their colours with our most beautiful flowers, and if the refraction of the light on the water did not hinder the view of a larger surface under the water, the mass of what is beautiful, living and flower-like which covers the shallow ground of the sea, would present the picture of our gay meadows and fields in spring; yea, he who has seen the heaths of Circassia in Asia would be reminded of the carpet of tulips which spreads to a very great distance, and forms, under favourable circumstances, an enchanting and fairy counter-part of our beautiful little gardens.

Although it is impossible for us to have such an extensive view over the fields of Zoophytes which are commonly called Coral banks, as we have over the gardens and fields of our common plants, yet even travellers, who do not as professional Naturalists examine and delight in the construction and the laws of the forms of organic bodies by confronting and comparing them systematically, will be most agreeably surprised and enchanted by the rich variety of forms and hues of these living flowers, which are sometimes of metallic brilliancy, sometimes of the most delicate tints. These inhabitants of altogether another world, pass like the pictures of the Kaleidoscope before the eyes of the landsman, who either walks along the shallow coast, or in a calm sails slowly in his boat over Coral banks. He sees clusters of shrubs and bushes on and around masses of stone apparently polished, which, themselves shining with brilliant metallic hues, indicate something more than mere masses of rock.

However, he who sails in a small vessel during a calm, enjoys a happier and richer view of these inhabitants of a new and to him unknown world, upon the luxurious Coral banks of the high sea, than he who travels along the coast, where the unequal depth of the sea produces only a few crippled specimens of this kind. At length, much excited and burning with curiosity, he steps into a boat, and endeavours in a shallow place to lay hold of some of the most beautiful of these forms, in order to examine them more minutely. The crew who on such occasions willingly assist, or he himself step out into the water, but as soon as they touch the ground of the Coral banks all those brilliant colors which an instant before beautified this spot, gradually disappear. The shrub-like brilliant red object, which a moment before had so vividly excited the attention and admiration of the traveller, is taken up out of water a brown insignificant mass, and upon examination it is found that the

form which appeared just now so graceful, delicate and gay to the eye, is a hard limestone, rough and covered with a thin brown slime. The traveller fancies he has been mistaken, and repeats his exertions and labours with no better success, till he is persuaded that here a change has taken place, which he, according to the turn of his mind, either calls a miracle and ascribes to enchantment, or esteems a remarkable phenomenon worthy of laborious and accurate examination.

The traveller who prosecutes his researches in the South-sea is more and more amused with this enchanting world. He observes here in the Coral bed a splendid living creature of a fiery red or brilliant emerald green colour, covered with numerous variegated threads and fringes very much like a large purple Pioni.

If approached within a short distance it seems to disappear, and in its place we find only a shrivelled, fleshy, shapeless grey mass. It was a sea-anemone, of which some appear to be 2 feet in diameter, and suddenly contract themselves to within half a foot, and sometimes 3 inches.

Small fishes, which are scarcely a few inches long and never grow larger, of a splendid gold, silver, purple and azure colour, play round the flower-like corals, like the colibris (Humming birds) in America, which play round the flowers of tropical plants. Curiously formed snails (Aplysiæ) without any shell, of a beautiful colour, gnaw the leaf like arms of the mollusck, just as caterpillers and garden snails gnaw the leaves of plants. Particularly interesting are certain forms which appear so perfectly like the leaves of mushrooms, that every traveller's attention is immediately directed towards them. They are found with long aculeated sea-hedge-hogs, gaping giant shells of various colours, ciliated porcelain shells, and others buried in sand between the Coral stems; they appear in the water of a brownish and sometimes glaring red color, with a beautiful green disc, which sometimes has a red ring, and sometimes radiated brown stripes. If they are touched, their splendid colours vanish, and if exposed to the air, they appear like petrified leaves of mushrooms without a trace of life, and merely covered with a very thin slime of a brownish colour, which can scarcely be scraped off with a knife, and the experienced observer alone perceives the mollusck which forms this large fungus form stone which is sometimes a foot in diameter.

These strange metamorphoses are facts long ago known and noted

down in the annals of mankind. The ancient Greeks, who were only acquainted with the fine red Coral of the Mediterranean, which was much valued, called these soft and delicate bodies, which are changed into stone if roughly touched, and which they believed to be plants—Virgins of the Sea, Κώζη or Κούζη άλος, from which, as linguists have observed (Heinsius ad Metam. IV, 749) afterwards, the ancients have formed the word Curalia and Corallia. We can easily imagine that Ovid, the Latin poet of metamorphoses, did not overlook these remarkable and strange changes. The following verses of his prove it:

"Sic et Curalium, quo primum contigit auras
"Tempore durescit: mollis fuit herba subuudis."

"As the Curalium also, as soon as it touches the air is suddenly changed "into a stone; it was a soft plant in the sea." Afterwards Pliny (LXIII, c. 25, and XXXII, c. 2,) gives a fuller account of these changes, and derives the word Curalia from the Greek word Κουσὰ (the act of cutting off,) because they are cut off under the water; however neither is this derivation correct nor the above probable. Pliny mentions the Soldiers of Alexander the Great, and King Juba II. as authorities for the sudden petrifaction of Corals. Solin observes that Metrodorus called the Corals *Gorgia* from the Orator Gorgias in Thessaly (according to Pliny in Sicily) who reached an age of 109 years, or (according to Pliny: VII, 48,) of 108, or (according to Cicero de senectute, c. 5,) of 107, as if they were petrified by age, which was afterwards probably by metonomy changed into the known word Gorgonia, a name given by Linne, and other modern writers to the Horn-Corals; although on the contrary, the Gorgones produced petrifaction by their appearance, and Pliny calls only the red Stone-Coral, as a precious stone Gorgonia (L. XXXVII c. 10.), Ovid tells us (Met. IV. 749) that Perseus, after he had killed Gorgo, put her head upon sea-plants, which in consequence became immediately petrified, and which now become petrified as soon as they are exposed to the air. Perhaps Ovid's Poetical dress has given occasion to authors of later times to call them Gorgonia instead of Curalia, for he himself does not give them that name. Dioscorides at the time of the birth of Christ, mentions the Corals (Κοράλλων) among plants, and addeth, the Corals are, as generally known, sea-plants, which are also called petrified trees (Lithodendra). Before Dioscorides, already Orpheus mentions them, perhaps 1200 years before Christ, if the work is not written by a more recent Orpheus, and speaks of them as peculiar minerals, and praises

the effect of the Κουζαλώιο against the bite of scorpions and serpents. Likewise Theophrastus, disciple of Aristotle, says in his book on Mineralogy 260 years before Christ: "also the Curalium (Κουζάλιον) is like a stone of a red colour, and grown on a root (πεζιφιζες perhaps πεζιφυες?)" In the Zoology of Aristotle the name is not found.

The earliest notice by an eye witness respecting the sudden petrifaction of the soft Corals, which I have met with—for all the notices of this circumstance given before this, are evidently not authentic, and only from hearsay, as they speak of the cutting off Corals (a thing quite impossible)—is given in Monconnys' Journal in the year 1630, which has likewise reference to the Red Sea, and which, as Strabo and Pliny had already observed, abounds in Corals. Monconnys' words, as it appears to me, have been frequently copied by modern authors without mentioning the source, although they have always altered and added several things, because the wonderful is more liked than the truth. This French traveller gives in his Journal the following account:—

"After dinner we caught in the Red Sea the species of petrified mush-
"rooms, shells and all sorts of shrubs which are above described, and
"which are found in abundance in long tracts, because the sea is there
"so shallow, that one can, as in a well, distinctly see all that lies on
"the bottom, and the ground is completely filled with such plants of
"various colours, which at a distance appear like purple, and make me
"believe that they have given the sea the name of the Red-Sea." *

"Curiosity induced me to step myself out of the boat and walk for
"more than a mile along the shore, where I amused myself for several
"hours in gathering a great quantity of such shrubs, fungi and shells.
"The fungi are hard and grown on the sand; I could not feel any with
"my feet, although I frequently tried it, and those that were taken up
"are red and hard; but in order to whiten them, they are laid on the
"shore, where they are washed by the waves and dried by the sun, and
"thus become white. As long as these shrubs are imperfect or not
"quite ripe, some of them are like the moist mushrooms growing on
"old trees, and others like the granulated feet of the sea-spider; they
"are soft, and so full of water that one can strain them like a wet

* This remark is not without prejudice, because the brownish tint of the Tang and Coral-plains is neither purple nor peculiar to the Red-sea. The Red-sea is remarkable rather on account of its depth than on account of its shallowness, as generally only a small strip of the coast and the Coral banks form shallow places, of which I shall afterwards give a fuller account.

"sponge. "In this state they are of all sorts of colours: blue, violet, "grey, brown, green, white, which has a wonderful effect." *

So far Monconnys. But if the account of this traveller is attentively perused again and again, there exists almost no doubt that he himself had only observed the hard Corals, and that the account of these bodies being at first sought, has been received from the mouth of the Arabs who accompanied him.

As far as I am aware, the first authentic account of the soft Corals is given by Hans Sloane in his Journal. He was made President of the Royal Society in London, and at the end of the 17th century (1695) visited Madeira and Jamaica and published a large well known work in 2 folio vols., with many prints rather harshly executed. In the first part of this work, page 55, he says that the Star-stones (Lapiddes astroite Astracæ) when young are soft; and on plate 21, fig. 1 to 3, there are prints of one of them with the name Lapidis astroitis sive stellaris primordia (young of the Star-stone.) But he thinks that very different kinds of various species of the Star-Corals are only various degrees of perfection of one and the same soft form, and represents a petrifaction from England as the most perfect of them. In the first instance he says the Star-stones are jelly like as the white of an egg or star-shoots! and afterwards they become opaque. But there is no doubt, that this traveller mistook the leather Corals, which never become hard, for young, still soft stone-corals; and already in the year 1776, Ellis and Solander justly consider the drawing made by him to be that of the Wart-Zoanthe (Alcyonium mammillosum, or Mammilifera mammillosa.)

Nearly a whole century after Monconnys (1720), the celebrated divine Thomas Shaw visited the East and the Red-sea, just at the time when the observations of Count Marsigli respecting the vegetable nature of Corals excited much interest in France. Fancying, as he did, these bodies to be of a vegetable nature, he mistook the well-known rays of the animalcula for small roots, and admired the wise economy of nature in their being more numerous than the simple stick roots of common plants. Although this traveller after a minute examination gave a de-

* In reference to this remark, the Medicinal-Assessor Dr. Bruckmann, in Wolfenbuttel, inserted, in the year 1745, a small Essay in the 8th volume of the A. ta Naturæ Curiosorum under the title—Lapides fungiformes Asaris ruori, which however contains nothing new or interesting; besides, as the author was not informed of the observations of Peyssonel and others, it is below the standard of perfection to which the science had already attained, perhaps on account of the difficulty of communication at that time. He has printed a fragment of the Fungia Agaricoformis, and copied the text out of Monconnys' Journal. It is probable that he had seen a traveller from the Red Sea who gave him a similar account.

tailed description of a great number of the Coral species of the Red Sea, still he does no where mention that they are at first soft and then grow hard. He writes as follows:

"What is wanting in Botany (on the Arabian Coast) respecting "the various classes of common plants, is supplied by the abundance "of sea-plants, as there is perhaps not a second place which contains "such a quantity of them as the Seaport of Tor. While sailing "slowly over the surface of the water I saw such a variety of Ma- "drepores, Tanges or Alges, and other marine vegetables, that I could "not forbear thinking them a marine forest, an expression which Pliny "before me used." *

"To this comparison I was led more particularly by the branching "Madrepores, for I saw several from 8 to 10 feet high, some of them "grew pyramidically like Cypresses, others extended their branches "like Oaks, not to mention the infinite number of others, which like "creepers spread themselves over the bottom of the sea."

"To these branching species one may add the marine fungia, brain- "corals, star-corals and other forms of Corals, which sometimes form "aggregates and masses of extraordinary magnitude, and are used in "Tor, not only for mortar, but also as a valuable material for building "houses. The proper marine fungia are always found on the Rock "with a sort of small root, and their furrows, unlike those of the mush- "room, are on the top." †

"This species of Coral, as likewise the brain-coral, always appears "to retain in its form a certain peculiar formation; it is true each of "the other kinds of Corals has its peculiarly formed little stars and "marks, by which it can be distinguished, but that is only on the sur- "face. For as they have not the least sign of roots, they can but be "considered shapeless masses of coral-substance, which as they gradu- "ally grow, adopt the form of the rocks, shells and other formations, "with which they came in contact, whilst these give them their forms." Shaw, Voyage Traduct. Franc. T. II. p. 85.

* Lib. XIII, c. 25. Nascuntur et in mari frutices arboresque, minores in nostro. Rubrum enim et totus Orientis Oceanus refertus est sylvis. In Mari vero Rubro sylvas vivere, laurum maxime olivam ferentem baccas et cumplust, fungos, qui sole tactimutantur in pamicem. Fruticum ipsorum magnitudo ternorum est cubitorum, caniculis referta ut vix procipere é navi tutum sit remos plerumque ipsos invadentibus.

† From this one may easily perceive that Shaw has not found the proper free fungia, or he must have mistaken for them the sticking thistle-Coral which is somewhat similar (Crayophyllia lacera), which after him only Savigny has observed near Suez in Ousseir. What he called brain-coral was evidently Maeandra labyrinthica, and what he called star-corals were several sorts of the species Astraea and Favia. What Shaw calls Madrepores are generally species of Heteroporа. Thus it appears that the Coral banks near Tor were very similarly inhabited in the year 1720 as a century afterwards in the year 1823.

It is quite extraordinary, that Peter Forskal, who in the year 1742, was sent by the Danish Government to accompany Niebuhr to Arabia and the Red Sea, as Zoologist and Botanist, and whom we have found on many occasions an accurate and unprejudiced observer, should have been deceived like Sloane before him, for he also mentions that he has seen Corals grow hard in the air. He says in his descriptio animalum &c. p. 132: "His in locis observator curiosus plura detegit paucis "diebus, quam toto anno alibi. Scopuli saxa littorea hic pretiosa "sunt eruditis, incommoda navigantibus; Turcis praesertim, qui altum "more timent et inter insulares proficiscuntur. Magna putatur scientia "nauten haec brevia prospicientis et evitantis. Discernuntur elonginquo "colore ex albo-virescente; grato oculis otiosis spectaculo; opposito "littoribus nudis, arenosis et tristibus. Usque addecem Orgyas vidi "haec saxa sungentia. Dum aquis extrahuntur, suprema parte inven- "runtur mollia inde magis magisque cartilaginosa; fundus est lapis "solidus."

From this last remark, so generally and plainly expressed, we cannot but conclude that Forskal either has observed that the soft Corals grow hard in the air, or he must have noticed that the tender sprouts and top parts of the stone-corals are always soft, the middle part cartilaginous, and the bottom part which is in the sea as hard as a stone. But although I well remembered the words of Forskal and had his book with me when on the voyage in the Red sea, still I never could understand this remark of his.

I found all genuine stone-corals under the water up to the last points always hard, as likewise the Dutch traveller Linschoten mentioned before me in the year 1599 respecting the Mozambique-Channel, and in the year 1702 Mr. Strachan respecting Ceylon, * and the more accurate examination of the upper stars in star-corals, even when they are dry, proves this truth so clearly and convincingly that there cannot be any doubt about it.

Of course we found also a great many leather and sponge-corals, which are always soft and never become stone. It is probable that

* Linschoten says: Ces escueils (Baixos de India i. e. Bassas de India) sont pour la plus part de [illegible] couleur noire, blanche et verde, horrible a voir—and tells us, that in May 1588 the Flag-ship St. Taques was wrecked upon them. Histoire de la navigation de Jean Hughues de Linschot. Amsterdam 1638 p. 149. Strachan writes as follows: "The branches (of Coral) are not softer when they are young, than when they are ripe, yet I have observed a slime upon them always when they are under water, which I suppose is the substance which petrifies. Phil. Transact. 23, p. 1248, 1202."

Forskal has been led astray by some of these branching sponge-corals, perhaps a species of the Lobularia, of which there are many very wide spreading, some of them when they are extended (especially Lob. leptocladus) are very much like the branchy Madrepores in magnitude, form and color; and it is likely that he himself would not have published this notice respecting them, which he left in writing, but Niebuhr did not venture to omit it, having found it in the manuscript of the author. It is true the skinny extended basis of the Lobularia, through the contraction of the whole, appears to be harder than the flexible points, and as the ends of the branches are thinner, they are in consequence also more flexible and even softer than the stem of Polypes which is rather thick. Perhaps these relations, together with the novelty of the thing, and the haste with which a traveller passeth by, may have contributed to lead Forskal astray. It is also likely that the remark noted down in the beginning, was not the result of his own observation, but a communication of the crew, which was to remind him to examine the matter himself at some future period. Besides Forskal calls the submarine coral-rocks, coral-mountains (montes Lytho phyti,) which cannot be said of petrifaction, and the expression he uses in the description of corals—legi in montibus Djedda septintrionalibus, clearly does not mean to say—I found them upon the mountains near "Djedda," but upon the submarine coral-rocks there.

Only in the present time through the exertions and the success of the late highly distinguished and accomplished Jules Cesar Savigny, one of the most industrious and learned publishers of the Description de l'Egypt, who unfortunately in consequence of his voyage to Egypt lost his sight, the attention of the public has been directed towards the soft coral-animals of the Red-sea, hitherto little noticed, which it is possible, by their similarity with those that become stone, have given rise to all those metamorphoses and ancient accounts respecting their being petrified in the air. In consequence of these researches and accounts which were given by Savigny, in the years 1799, 1800 and 1801, Lamarck formed a new family of corals which he called Polypes (tubuliferes), and Schweigger, who had an opportunity to examine the specimens of Xenia in the Museum of Hunter in England, which Lord Valentia had brought from the Red-sea, published in the year 1819 (Observations from Philosoph. Voyages, p. 91), a fresh and very particular statement, that there is a family of coral-like Zoophytis without a lifeless sub-

stance, which contain sometimes animals like Anemones, sometimes like Hydræ, and run parallel with the stone-corals (p. 100.) What Schweigger only in a few broken sentences hinted at and presumed, and Savigny, probably on account of his superficial observations, never has described in detail (as will appear from the drawings, although beautifully executed), that I hope I have placed beyond doubt by many new observations in my former paper, and therefore do not repeat it here, but intend in future to treat of it in a more special manner.

As in ancient times, so only a short time ago, a very respectable traveller has entertained those ideas of their being metamorphosed. John Barrow, a celebrated voyager, and Secretary of the Board of Admiralty, is of opinion, that the islands in the Pacific are formed by coral-animals, which he describes as jelly-like worms, which are soft and pliable like wax, and only grow hard like a stone when life is extinguished.*

Barrow recommends the survey of the Maldives near Ceylon,† which according to Ibn Batuta are 2,000 in number, but according to Peyrard de Laval, 12,000. Also Captain Beechey is of opinion that he lately saw Coral animals engaged in filling up lakes.

This experienced observer of coast and sea is of opinion, that the innumerable isles of the South sea, some of which are extensive and inhabited, have been formed by the buildings of these little creatures which rise from the bottom of the sea and gradually grow hard; and consequently allows, that they have a remarkable influence upon the formation of the surface of the earth. The importance which the Coral-animals have acquired by such a relation to the numerous isles of the South-sea, in

* In the German Journal das Ausland 1832, No. 16 and 18, we find the following account given by him in 1831 at a meeting of the Geographical Society in London, whose Vice President he is. However it is not published in the 1st Vol. of the Journal of that Society. He says: "Of all the revolutions produced by Volcanoes upon the surface of the earth, none is so "remarkable and so little known until the present time as that which elevates parts from the "bottom of the Ocean unto its surface or only a little beneath, which are afterwards by the plas"tic labors of small insoon idorable creatures, which have scarcely received a place in the "Classification of the grand system of nature, changed into fertile soil. We know very little "of their physical organization and the means by which they execute their gigantic buildings, "and have given their incredible activity the term of *instinct*, but which, like Hunter, I prefer "to call the spur of necessity.

"It would appear quite incredible that these small jelly-like worms, should have produced "thousands of islands and acres of land in the Atlantic, but especially in the Pacific and Indian "Oceans. If they had not been as it were always seen actually engaged in this work. If one is "aware, that these small neat pipes of calcareous matter when they are brought up out of the "Ocean, are soft and pliable like wax, and become as hard as a stone when the life of these "small animals is extinguished, one can scarcely entertain a single doubt respecting the mode "of their occupation during life. Yea! the increasing number of islands, and their gradual "growth, could no longer remain subjected to a doubt, but this work progresses slowly and "silently, and the Observations are still too new and too few."

† The recent survey of these islands afforded excellent opportunities of studying the formation of land by Coral animals, and it is to be regretted that o little has yet been communicated to the public by the intelligent officers employed. Capt. Moresby is understood to have communicated some of his observations to Mr. Darwin for publication in his work on Coral islands, on which he has been long engaged.

like manner with many other travellers of the present time, is of too great and universal an interest, that it should not be a very proper object of the more special natural philosophy to investigate and develope these relations in a more accurate manner.

On my voyage I took care to observe not only the Corals and the general impression their forms make upon the imagination, but also more particularly the buildings of Corals in the Red Sea, and what I have been enabled to discover in company with my late friend Dr. Hemprich, who died in the midst of this occupation on the coast of Abyssinia, I am happy now to communicate.

The further communications which follow immediately those that were made here last year, are divided into two parts, viz. into a Critico-Historical enquiry into the influence of coral-animals upon the surface of the earth, to which are appended my own observations and those of Dr. Hemprich on the coral-banks of the Red sea; and into a systematical treatise, which more accurately explains the view which was given last year, of the families and species of coral-animals, newly arranged throughout, according to physiological principles, and which distinguishes by short descriptions, those specimens which we observed in the Red Sea, and which are also found among the specimens in the King's Museum, with all which I am perfectly acquainted.

As the latter, the systematical parts, serves the former, the critico-historical, as a basis, and therefore should be the first, is not well adapted for a lecture, I begin to give a short historical view of the nature and formation of coral-banks as hitherto known.*

(To be continued.)

Extracts from Proceedings of the Geological Society, London.

A letter, dated Madras, July 1840, addressed to John Taylor, Esq., Treas. G. S., by Mr. Frederick Burr, on the Geology of Aden on the coast of Arabia, was afterwards read.

The promontory of Aden, eighty miles eastward of the Straits of Babelmandel, consists of a bold cluster of volcanic rocks with lofty jagged peaks, and is connected with the mainland by a low isthmus. Its extreme length is about six miles, and its breadth is about three miles, and the summit of the highest point is about 1776 feet above the level of the sea. The loftier

* To avoid repetition, the systematical part of this lecture has now been blended with the less special systematical view given last year, as they are printed at the same time.

portions of the promontory are wholly volcanic, and the lower are partly volcanic and partly consolidated sea-sand. The most interesting portion of the district is an immense, nearly circular crater, situated at the extremity of the promontory next the main land, and in the centre of which, upon a flat little raised above the sea-level, stands the town of Aden. The diameter of the crater is about one and a half mile, and it is surrounded on all sides but the eastern with precipices chiefly composed of lava, and rising from 1000 to 1776 feet in height. Although the crater appears at first sight almost perfect, Mr. Burr says, it has been affected by some rude shocks which have cleft it entirely through from north to south, forming two rents, known as the northern and southern passes. The portion to the west of the fissures, and called the Gebel Shunsam, rising to the height of 1776 feet, stands entire; but that to the east has evidently undergone a partial subsidence, attaining to not more than half the height of the western side, and for the distance of about half a mile it has been broken down, allowing the sea to come almost close to the two and form a little bay; but the direction of the original outline of the crater is indicated by the island of Seerah, situated in about the middle of the gap.

To the northward of this great crater is an immense mass of lofty and jagged volcanic products, probably the remains of smaller craters.

The prevailing rock is a dark brown or chocolate lava, generally of a very cellular structure. About the middle of the east side of the great crater, it contains a very thick mass composed of alternations of greenish porphyry, slightly lamellar in structure, and of red ochreous clay. Near the northern pass Mr. Burr noticed a granular rock, or volcanic breccia. The inclination of the beds is generally 15° from the crater.

Numerous perpendicular dykes intersect the volcanic rocks, and are harder and more compact than the beds they traverse. Small veins of calcedony also occur.

Dr. Malcolmson, Bombay Army, showed Mr. Burr some specimens of black and green obsidian obtained on the promontory, but the conditions under which they exist Mr. Burr was prevented from ascertaining.

The deposits of consolidated sea-sand occur more especially near the northern pass, towards the base of the volcanic ridges. The stratification is diagonal, and this arrangement Mr. Burr conceives to have been produced by the drifting of opposing currents. The flat line of coast on the northern part of the promontory, the author says, is evidently a raised beach, and the consolidation of the sand he assigns to the action of a tropical sun upon the calcareous materials. The stone incloses numerous shells and corals of species existing in the Arabian Sea.

PROCEEDINGS OF THE ASIATIC SOCIETY.

27th January.

Donations to the Library.—Nos. 17—21 Wight's Icones plantarum, by Government—Malcolmson's Fossils of the Eastern portion of the Great Balsatic district of India, by the author—Translation of two Copper Sunnuds, by H. B. Crockett, Esq.

Donations to the Museum.—A Chinese Rocket, by Capt. Ramsay—Snakes and Scorpions from Aden, by Col. Dickenson.

10th February.

The resolution to establish a Quarterly Journal was carried unanimously.

Donations to the Library.—Captain Fitzgerald's Memorandum on the operation of removing the wreck of the *Equitable*, by Government—Peltier's trial for a libel against the Emperor Napoleon, by J. C. Steuart, Esq.

Captain Ramsay; H. G. Gordon, L. C. C. Rivett, and C. J. Erskine, Esqs., were elected Members.

10th March.

Donations to the Library.—Adam's third Report on Education in Bengal and Behar, by Government—H. B. Crockett, Esq. was elected Member.

The Rev. J. Wilson, D. D., Rev. G. Pigott, J. G. Malcolmson, Esq., Dr. Morehead, Lieut. W. Montrion, and the Secretary were appointed Curators of the Museum for the present year.

14th April.

Donations to the Library by the Court of Directors.—Sir Francis Palgrave's Ancient Calendars and Inventories, and documents illustrating the History of Scotland—Sir H. Nicholay's Privy Council of England—Excerpta e Rotulis Finum in Turri Londinensis asservatis Henrico tertio rege—Records of Caernarvon—Rotuli chartarum in turri Londinensi asservati—Inquisitionum in officio Rot. Cancellariæ Hibernensis asservatarum—Report on the public Records 1837—Rotulorum cancellariæ Hiberniæ calendarium.

Donations to the Museum.—Preparation of the bones of the human Ear, and Insects, by Dr. Barrington—Specimens of Mohammedan architecture, by Mr. Lumsden, C. S.

Elected Members.—Rev. W. K. Fletcher, and T. S. Burke, Esq.

12TH MAY.

The Rev. Dr. Stevenson read his paper on " The Dowry received by Kashivan."

Donations to the Library.—Appendix to the Report of the Committee of Public Instruction, *and* the Acts of New South Wales 1839, by Government—Dr. Ochterlony's Mineralogical Report on a portion of the districts of Nellore, Cuddapah, and Guntoor, by himself—1st to 20th volumes of the Pamphleteer, by Col. Griffiths.

Donations to the Library by the Government.—A view of the Evidence before the House of Commons on the petition of the East India Government for a redress of grievances—Dr. Wallich's report on the Calcutta Botanical Gardens—Dr. Falconer's report on the Botanical Gardens at Serampoor—Wight's Illustrations of Indian Botany, vol. 2, part I.—Wight's Icones Plantarum, vol. 2, part II.—Royle on the productive resources of India—Ancient Laws of England, published by the Commission on the public records. *By the Astronomical Society.*—Their memoirs, vol. II.—Reinaud's Geographic d Aboulfeda, by the author—Von Hamner's Falkner Klee, by the author—Magnetic Observations at Trevandrum, by Mr. Caldecott.

14TH JULY.

Donations to the Museum.—A trimurti, and a collection of minerals principally illustrative of the quartz family, by Lieut. Blake. Gypsum from below the passes between Kirmansha and Bagdad, by Hon. T. Dunlop.

A portrait of Col. Sykes was presented by Col. Lester, and the Society directed that it should be framed and hung up in their rooms.

11TH AUGUST.

Donation to the Library.—Romano's Tesoro Britanico, by T. Bowman, Esq.

Donations to the Museum.—Twelve Specimens of English coal, and six illustrative of the Alum manufacture in Cutch, by J. Bowman, Esq.

8TH SEPTEMBER.

Elected Members.—B. A. R. Nicholson, A. Campbell, and L. D. A. Blane, Esqrs.

Donations to the Library.—Frere's Translation of the Frogs of Aristophanes, by W. E. Frere, Esq.—Brett's Surgery in India, by the Bombay Medical Board—Statistics of Western Australia, by the Governor of Western Australia—Translations from English Scientific Elementary treatises, by H. H. the Nuwab Shams ool Oomrah Bahadoor.

Donations to the Museum.—The present current Coins of Egypt complete with the exception of three gold coins, by Lieut. James Young, I. N.—Specimens of the Coal and the rocks associated with it, from Travancore, by T. Bowman, Esq.

To A. B. Orlebar, Esq.
Secretary of the Bombay Asiatic Society. in Bombay, &c.
Berlin, Prussia, *June* 18, 1841.

Sir,

Some weeks since I had the pleasure to receive your kind and esteemed letter dated April 1, *a. e.*, and I am highly indebted to you and to Messrs. the Curators of the Bombay Asiatic Society's Museum for the acceptance of my proposal. I hastened to pack up for you two boxes of minerals, containing 400 specimens, viz., 260 minerals and 140 petrifactions. The boxes are sent to Stettin, and will be forwarded from thence to the given address in London by the first vessel. I hope they will arrive in Bombay in good order.

Permit me, Sir, to make some remarks on the things sent. I had wished, that you had given me some notices on your Museum, and on the manner of your collections. Some collections are made more for the exterior lustre, others more for the view, others more from a scientific point of view, containing not only such minerals which have a rich splendour, but also such which are remarkable by their interior chemical composition, or by their interesting form. Some collections wish only specimens of a great size, others more in a minute form. Some collections are limited to minerals; others to petrifactions; others interest themselves for Mineralogy and Geology. It is also very difficult to make a first invoice without knowing the manner of collecting, and the wishes of his friends.

However, Sir, I have done my best to make my invoice so that it may give you satisfaction. I have not sent more than 4 specimens at the most of the same sort, not having known whether it may be desired by you to receive more of them. The first 100 specimens are from Sweden; they are a result of the great travels I made in this interesting country, and they cannot be procured finer. They are distinguished less by their exterior splendour, than by their chemical composition, by their containing the most rare substances, like Eberium, Lanthanium, Tantalum, Yttrium, Lithian, &c. Then you find a number of things from Bohemia; some of these are not so good as I had

wished, but I had them not better at the time. I think to make in this summer a journey to Bohemia, and if I should succeed to collect a very fine stock of minerals, as I have no doubt, then I shall send in the autumn a third box to you. The rest are minerals from Bavaria and other parts of Germany, and from Norway, and an addition of petrifactions. I hope, Sir, that the whole will give you satisfaction, and that you may regard it like a rich enlarging of your mineralogical collections.

I request you, Sir, to send me in return in minerals from the East Indies, what you may think are just and equitable or equivalent. I am in the possession of one of the greatest and most beautiful collections of minerals we have in Europe, but I am exceedingly poor in the mineral productions of your large and unknown country. Every interesting mineral will also be desirable to me, and being in relation of exchange with the greatest part of our collectors, you may send a *number* of specimens of the *same* sort, supposing that this sort is remarkable.

Being a scholar of the celebrated Mr. Mohs, I do occupy myself particularly with Chrystallography, and consequently CHRYSTALLIZED specimens are particularly interesting and desirable to me. I do not occupy myself with Geology, and in general I do not collect petrifactions;—but if you have any remarkable thing unknown in Europe, I shall be thankfully obliged for its communication.

I wish particularly the following things:—

A rich and beautiful suit of the crystallized minerals of the Zeolite family from Poonah, viz. *Apophyllithe* xx, *Poonahlite* xx, Henlandite xx, Stilbite xx, Chabasite xx, Laumontite xx, etc. etc.—*Red Turmaline* xx, from Benares and from Bengal. A suit of *Diamonds* from Golconda, in their different crystallizations.—Such a suit of the *Diamonds* from Borneo. *Zinkon* xx, from the Circars.—*Sapphire* xx, *Corfudams* xx, *Zirkon* xx, etc. from Ceylon.—*Indianit* (Boavnon) from the Coast of Coromandel. Tin Ores from Banco Island.—*Chrysabrul* xx, *Chrysolite* xx, *Ruby* xx, etc. etc.—But also every other interesting mineral will be desirable to me, and I repeat, that you may send me a *number* of the same sort, which perhaps you may have abundantly.

Send the return in a sailing vessel—(not per Steamer), that the expences may be as low as possible.

I wish particularly to augment my relations of exchange with your country, and I request you, Sir, if possible to communicate to the Members of your esteemed Society the following address:—

Dr. Fr. Temnan, junior, in Berlin, Prussia, care of Mr. H. Pontoppidan in Hamburgh, offers to every Scientific gentleman, who is a friend of Mineralogy, an exchange of fine and well crystallized minerals from Europe, and particularly from Germany, Norway, and Sweden, for such mineralogical productions of the East Indies.

Perhaps you would have the goodness to put those lines in your highly esteemed Journal, and I should be highly indebted to you for your complaisance.

Should you be acquainted with some scientific gentlemen, or perhaps with some public collection or museum in your country, f. i. at Calcutta, Madras, Singapore, etc. etc., which you may think able and willing to enter into such an exchange with me, then I should be highly indebted to you for the communication of their addresses to me, and of mine to them.

I took the confidence to put into one of the boxes two copies of one of my pamphlets "Monography of Chabasit," the one for you, the other for your Society. I request you to accept the first as a mark of respect and consideration, and to present the other in my name to your esteemed Society.

I hope, dear Sir, to hear from you, and I flatter myself, that the first essay of exchange will be repeated very often. I request you to agree the expression of respect and consideration, with which I have the honor to remain,

Sir,

Your most obedient Servant,

Dr. Fr. Tamnan, *junior*.

Address

Dr. Fr. Tamnan, *junior*,

Berlin, Prussia.

Care of

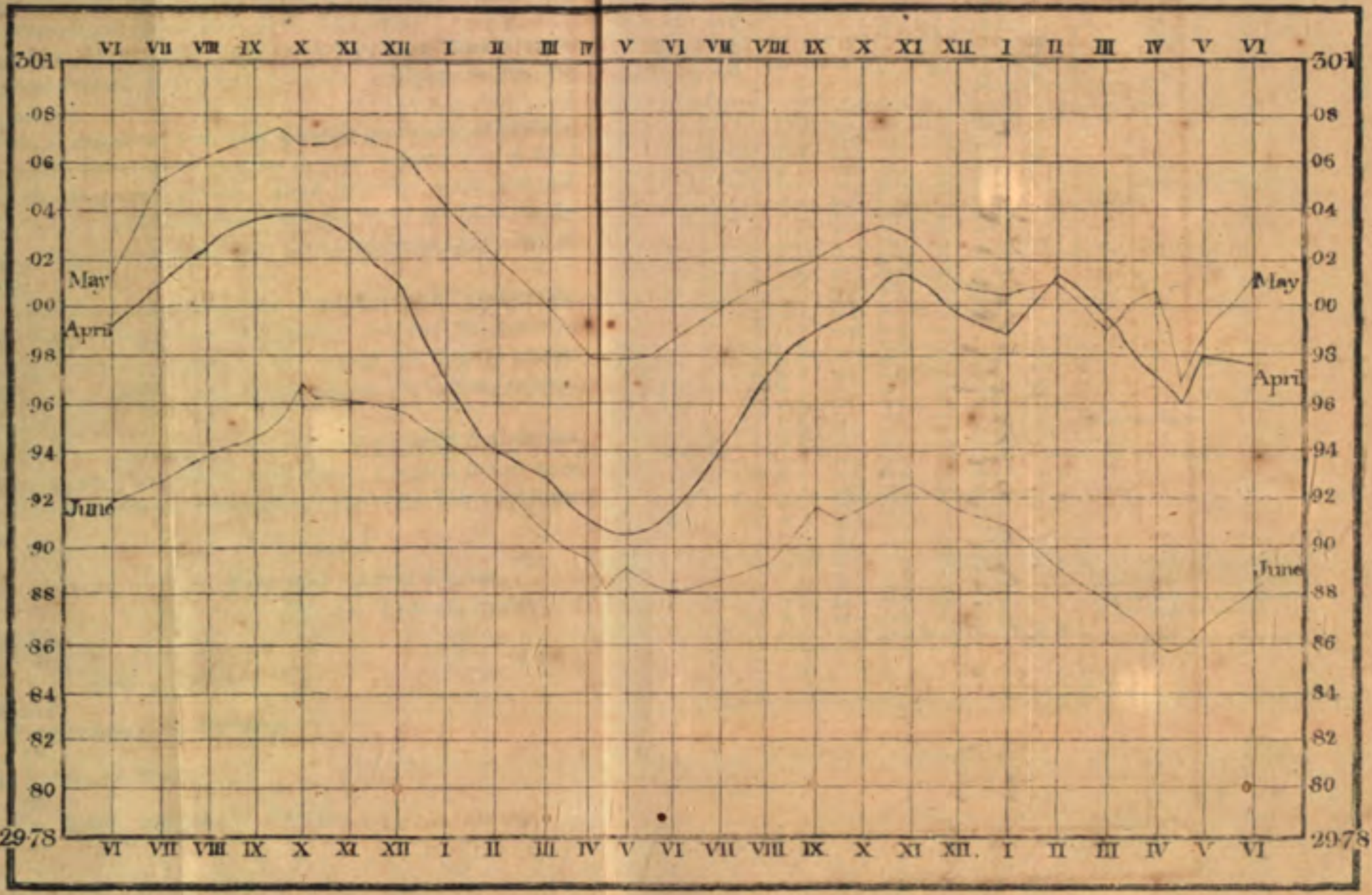
Mr. H. Pontoppidan, *in Hamburg*.

Or

Mr. Ed. Nicol, *in Stettin*,

Or

Messrs. Fr. Bohm and Co., *in Danzig*.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May
April
June
May
April
June

METEOROLOGICAL OBSERVATIONS, BOMBAY OBSERVATORY.

21st JULY, 1841.

Time.	Hour.	Barometer.	Thermometer. Attad.	Thermometer. Detad.	Wet Bulb.	Sympiesometer.	Attad. Thermometer.	Winds.	Remarks.
A. M.	6	29·774	81·9	82·0	79·8	29.65	82.2	W. S. W.	
..	7	·795	82·0	82·1	79·0	·66	82·2		
..	8	·805	82·8	82·9	79·5	·67	82·9		
..	9	·82	83·2	83 4	80.0	·67	83·4	W.	
..	9½	·83	83·4	83·7	80·0	·68	83·7		
..	10	·828	83·8	84·0	80·0	·67	84·2	.....	The wind is remarked as blowing very strong.
..	10½	·826	83·8	84·0	80·0	·66	83·9		
..	11	·830	84·2	84·4	80·0	·66	84 5		
..	12	·810	84 0	84·1	80·0	·65	84·2		
P. M.	1	·790	84·2	84·0	78·6	·62	84·7		
..	2	·786	84·0	84·5	80·2	·61	84·9		
..	2½	·754	84·9	85·1	80·2	·59	85 2		
..	3	·778	83·7	84·1	79·2	·61	84·5		
..	3½	·770	84·6	84 8	80.0	·54	84·8		
..	4	·762	84·3	84·6	80·0	·53	85·0		
..	4½	·743	83·5	83 6	79·4	*·59			
..	5	·740	83·2		79·8	*·59			
..	5½	·741	83·0		80·0	*·60	84·8		
..	6	·742	82·8	83·9	80·0	*·62	83·6		
..	7	·750	82·5	82·7	79·6	·62	82.8	W.	
..	8	·760	82 0	82·6	80·0	·64	83 9		
..	9	·764	82·3	82·6	79·7	·66	82·7	}	Wind very high.
..	9½	·768	82·3	82·6	79·6	·67	82·8		
..	10	·773	82 3	82·7	79·6	·69	8 :·9		
..	10½	·776	82·5	82·6	79·0	·68	82 7		
..	11	·782	82·3	82 7	79·4	·70	82·9	W. S. W.	
..	12	·774	82·5	82·7	79·5	·68	82 9		
A. M.	1	·750	82·0	82·5	79·2	·68	82 5		
..	2	·724	82·1	82·4	79·5	·63	82·6		
..	2½	·716	82 1	82·4	79·4	·64	82·5		
..	3	·708	82·0	82·3	79·5	·62	82·4		
..	3½	·722	81·9	82·2	79·2	·64	82·4		
..	4	·722	81·9	82·1	79 3	·64	82·3	.....	The sky overcast with clouds throughout the day excepting about 3½ A. M., but only a few drops of rain fell.
..	4½	·720	81·9	82·1	79·3	·63	82·3		
..	5	·73	81·9	82·0	79·2	·65	82·2		
..	5½	·730	81·7	81·8	79 5	·65	81.9		
..	6	29·730	81.5	81·6	79·0	29·66	81·8	W. S. W.	
..	..	..	..	..	..	..	..		

21st AUGUST, 1841.

Time.	Hour.	Barometer.	Thermometer. Attad.	Detad.	Wet Bulb.	Symp. leometer	Attad. Thermometer.	Wind.	Remarks.
A. M.	6	29.752	79·1	78·7	77·0	29 85	78·4	W. N. W	
..	7	·767	79·1	78·6	77·0	·88	78·7	W.	
..	8	·783	79·6	79·	77·9	·9[illegible]	79·	W. S. W.	
..	9	·802	80·1	80·1	78·4	·91	79·6	..	
..	9½	·810	81·0	80·[illegible]	78·0	·90	80 5	..	
..	10	8.5	81 3	81·3	78 7	·85	61·3	..	
..	10½	·814	81·5	80·7	77·8	·89	81·2	..	
..	11	·805	81·0	80·5	77·5	·89	80·8	S. W.	
..	12	·8·0	81·3	81·3	78 8	·88	81 2	W. S. W	
P. M	1	·780	82·1	82·0	78·8	·84	82·	..	
..	2	·770	82·5	82·2	78·7	·82	82·2	..	Cloudy. with rain at intervals.
..	2½	·765	82·3	82·5	78 0	·81	82·[illegible]	..	
..	3	·758	83·1	82·8	79·2	·79	82·[illegible]	..	
..	3½	·752	83·1	82·6	78·9	·80	82·8	..	
..	4	·750	83·0	82·[illegible]	77·0	·81	82·5	W N. W	
..	4½	·748	82·0	80·8	77·9	·82	81·2	W. S. W	
..	5	·750	81·8	80·6	77·5	·82	80·6	..	
..	5½	·75[illegible]	81·5	79·7	76·9	·85	80·[illegible]	S S. W	
..	6	·760	81·2	79·7	76·9	·86	79·9	S. W.	
..	7	·781	80·9	79·5	76·9	·88	80·	W. S. W.	
..	8	·805	80·6	80·0	77·9	·91	80·5	..	
..	9	·817	80·0	79·2	77·4	·92	79·5	W.	
..	9½	·82[illegible]	80·0	79·3	77·0	·93	79·5	..	
..	10	·817	80·0	79·4	77·1	·93	79·7	..	
..	10½	·8·0	80·0	79·5	77·2	·9[illegible]	79 8	..	
..	11	·821	80·1	79·6	77·1	·93	79·5	S. W.	
..	12	·807	80·1	79 7	77·7	·92	79·5	S. S. W.	
A. M	1	·795	80·2	79·7	76·0	·90	80 0	S. W.	
..	2	·7[illegible]	80·3	79·7	77·6	·89	80	W. S. W.	
..	2½	·775	80·3	79·7	77·2	·88	80·0	..	Few clouds.
..	3	·761	80·2	79·[illegible]	77·3	·87	79·8	..	
..	3½	·770	80·0	79·6	77·0	·88	79·8	..	
..	4	·772	79·9	79·7	77·4	·88	79 5	..	
..	4½	·768	80·0	79·6	77·2	·89	79·5	..	
..	5	·770	80·0	79·6	77·2	·88	79·9	..	
..	5½	·780	80·0	79·5	77·0	·90	79·8	..	
..	6	29·768	79·9	79·6	77·0	29·90	79·[illegible]	W.	
..	..	..	..	..	..	..	..	..	

21st SEPTEMBER, 1841.

Time.	Hours.	Barometer.	Thermometer. Attad.	Detad.	Wet Bulb.	Hygrometer.	Attach Thermometer	Winds.	Remarks.
A. M.	6	29·82[illegible]	80·3	79·[illegible]	74·	29·94	80·2	W. S. W.	Nearly calm.
..	7	·84[illegible]	79·9	79·[illegible]	76·	·9[illegible]	79·8	E.	Wind fresh. Cirro stratiand nimbi.
..	8	·87[illegible]	80·9	80·5	77·	·98	80·5	..	
..	9	·85[illegible]	82·8	82·[illegible]	78·	·95	82·3	S. E.	
..	9½	·84	83·6	82·[illegible]	76·[illegible]	·97	82·[illegible]	..	
..	10	·89[illegible]	82·3	82·4	77·3	·9[illegible]	82·3	..	Cloudy.
..	10½	·89[illegible]	82·5	81·[illegible]	77·[illegible]	·99	82·0	Calm.	Little rain.
..	11	·9[illegible]	82·4	82·[illegible]	77·7	·99	82·2	W.	Cirri, nimbi.
..	12	·87·	83·4	83·	77·[illegible]	·93	83·4	..	
P. M.	1	·85[illegible]	81·9	84·[illegible]	77·[illegible]	·88	84·5	..	
..	2	·[illegible]80·	85·[illegible]	85·4	77·[illegible]	·83	85·7	..	
..	2½	·82[illegible]	86·0	85·[illegible]	77·[illegible]	·8[illegible]	86·0	..	
..	3	·82[illegible]	86·1	85·[illegible]	77·[illegible]	·8[illegible]	86·2	..	
..	3½	·82[illegible]	86·2	85·[illegible]	77·[illegible]	·8[illegible]	86·3	..	Cirri, cumuli, and nimbi.
..	4	·8[illegible]	86·[illegible]	85·7	77·3	·83	86·2	..	
..	4½	·82[illegible]	86·1	85·[illegible]	77·[illegible]	·84	86·0	..	
..	5	·82	86·0	85·[illegible]	76·7	·84	85·4	..	
..	5½	·82[illegible]	85·2	84·[illegible]	76·[illegible]	·86	85·0	..	
..	6	·82[illegible]	84·6	8[illegible]	76·2	·87	84·2	..	
..	7	·8[illegible]0	82·9	82·0	75·[illegible]	·91	82·5	..	
..	8	·831	82·0	81·[illegible]	75·[illegible]	·94	81·[illegible]	..	
..	9	·84[illegible]	81·7	81·[illegible]	73·[illegible]	·97	81·5	..	Cirri in a clear sky.
..	9½	·8[illegible]0	81·4	80·[illegible]	75·0	·97	81·4	..	
..	10	·85[illegible]	81·2	80·[illegible]	74·5	·98	81·[illegible]	..	
..	10½	·85	81·2	80·[illegible]	74·[illegible]	·99	81·2	..	
..	11	·84	80·9	80·[illegible]	74·[illegible]	·97	81·	..	
..	12	·84[illegible]	80·9	80·2	74·[illegible]	·9[illegible]	80·[illegible]	Calm.	
A. M.	1	·83[illegible]	80·8	80·[illegible]	74·[illegible]	·9[illegible]	80·7	..	
..	2	·8[illegible]0	80·2	8[illegible]	74·[illegible]	·9[illegible]	80·[illegible]	N. W.	
..	2½	·82[illegible]	80·1	79·[illegible]	74·[illegible]	·94	80·[illegible]	W.	
..	3	·8[illegible]	80·1	79·[illegible]	74·[illegible]	·94	80·3	..	Rain clouds gradually increasing.
..	3½	·82[illegible]	80·2	79·[illegible]	74·7	·9[illegible]	80·2	..	
..	4	·83[illegible]	80·1	79·[illegible]	74·[illegible]	·9[illegible]	80·[illegible]	..	
..	4½	·83.	8[illegible]·1	79·[illegible]	74·5	·90	80·2	..	
..	5	·84[illegible]	80·1	79·[illegible]	74·[illegible]	·90	80·2	..	
..	5½	·8[illegible]	80·0	79·[illegible]	74·5	·9[illegible]	81·[illegible]	..	
..	6	29·855	80·0	79·[illegible]	74·3	29·9[illegible]	80·[illegible]	W. N. W.	
..	..	..	..	..	..	..	..	..	

Jain Inscription at Girnar see Article I.

मान्तः संसदीमानसोल्लासपोषाना यातिस्मवाभ्रमपरिताणानुरागासपाः। पीयूषद्रुतविप्रणादिजगता
तायदासारस्त॥ पक्कोलेः समसमरुहिपदोतनाथाश्रिरत्नोतादरेजिरविजगतिजागत्सताथामपि। दासंगत्यपरिषत्सत्यर
स्वयउरतशीश्वत। र्तकैन्यूपपूरतः नकटपुकुटानीलरथपूरुमाश्चिनारतृजिनतिमतैनिभिरेथोविधिमांडटीपरमवनरमासिंभूगणहतायदहामतिरीनव
Break in the Stone
सायविग्रकरिणादंतुनथार्थिनासाफल्यायधिनतियाफलततिमाकंदनाधर्मिणां॥ भृग्नकंमुतसंयुतंसुशनतोपूनायकीनृणां। तांधिस्वकद्वी॥
तमाः श्रीअंबिकासंस्तुत्य॥४॥ श्रीउड्डायनगिरिराजमधिम। नीतसदूर्मकर्मकर्णाद्यमिनोजनानां। सांनिध्यमीहीतममीगुरुमद्यनादालशाधिमपवृनय
सेदशारृजैतु॥५॥ अथच॥ नानातीर्थोपवनतटीनीकानेरम्यहर्म्यैःयोगरभूमीपतीरथुकृतानंतानोत्स्यं॥ शास्यद्वषाभृदः पेधिपूजांताद्यंघः सु
रासारांशोदांमनुपमगीरीतद्रेवतालंकृतियः॥६॥ यागागर्यममर्त्यपर्वतपरांमीतंजंतस्त्यथा॥ श्रांभ्यंतरविद्वंदमभूतयः स्फटकनमुखाशाएकीरेवनभूध॥
रविजयमांपद्दर्शनामाणीनां॥ यांनाभ्यांतीर्थियर्जिनाः किलमहानैदंसुरवश्रीजुषः॥७॥ तथच॥ गीरिस्फुरदुरुशिनिर्जितभूरिशारवादयः॥सपर्यमहीमास्यदंजगतिपै
शश्राग्रस्तद्वारः येदुद्वयशियांगजाकृतबलमुख्या कलंजतिंदतिनिर्मलामखिलसत्सुमुक्ताश्रियः॥८॥ वंशेस्मिन्यदुनायकावरपानरत्नुग्राशार्यावरलगसिद्राजकु::
लंगुणोपधिपुलंश्रीयादवख्यातीमत्॥ श्रमाभून्नृपमंडलीतनपदः श्रीमंडलीकः क्रमात्॥ मासादंगुरुहिमपवतनीशीयोचकरंनेमिनः॥ ९॥ तयपनृपतीरत्नुरिवसुनु
नेयधनमहीतयाजसमादधानः॥ नवपनदृष्टिमजातोनवपनवनसारसदृशशालिरामः॥१०॥ महीमहगूमहीपालदेवः पुवरतुरियाजनियन्नृदेवः यदानदास्यं
सुरथनुरन्त॥ दुसूदानीमगनन्नपतं श्रीमभासासामथामासदकृत्॥११॥ संगारसंमीपुराज्यनृस्ते॥ संगारएवाजनिभूमिजानिः॥ शृंगारकतकुलराज्यलस्यशृंगारप
राजगतीलताया॥१२॥ माणीतृश्रीजयसिहदेवनृपतीनभूभीमीनिभास्वाशरसालसाईनयनोन्यांबुधिश्यतरुक॥ शशुभासनृकुद्मतापमहीमानसृसगाभृततीः
स्फूर्जन्योतिमणीमयूपसलिलमक्षालिनांघ्रिद्वयः॥१३॥ दिक्रतनदनुग्माकलसिंहः शत्रुनृपगजभेदनसिंहः॥ यस्यनापमभजयदिहस॥सम्यनःसरसिज
कलहंसः॥१४॥ तदनुग्मक्रमरद्यनरश्वरःसमभवद्यपरोपुजे॥ भृमरतांकलयन्मलांगधान्॥१५॥ तत्सोदयसानुम
भुरुधन्नुग्मायस्तताषाडुता॥ दिक्रुषकुमस्तत्मकीर्तभूभृग्छरारभासुरः॥ आसीत्श्रीमहीपालाद्यनृपतिः निर्शितारीक्षमा॥ पालान्यु
कृतनीः कुनीतिनिधिरमध्यसनमत्यलः॥१६॥ दनुजनर्जयनिद्विषद्विरिकुलमास्फकपंचाननः॥ श्रीमन्मंडलीकक्षितिश्वरशिरकोटीरहीरप्रभत्व
सिधुम्फपलक्षिनाक्रतगतिवभ्रम्यानयाधिपतिर्फिर्तिस्त्यमतीत्यवार्द्विबलयैवाईसारधरः॥१७॥ नाल्पठुः कृतउन्नतोनरपतीः कस्याः कृताधिरयचूः
स्वयचेकुरुतः किमचत्रतिनोकिंदिदृक्षुतः स्थामीनासोराशाधिपतीः सुरायरिपुभिश्चरुथकीमतीनः। किंदकंडलीकः॥ क्षतिश्वरईहाश्रीराजतीश्रीतः॥१८॥
श्रालानस्तंभकुंभाजयकलकलन्नस्यासुरयाभाधिस्तनुः॥ कनुःशार्यायासाग्रहपादधिमथनतपसोम्भक्षणोक्रः पूर्वाद्रिः स्वदृचवरवरकिरणरुधांयेरिराजांगनाना
मुधायेधव्यदिक्षाजयतिनरपतिर्मंडलिकस्यवाकुः॥१९॥ एतारमत्यार्थिनावुःकिमपिहिवचः श्रायायहंतस्मृतां॥ यस्याश्वीयोग्रियाग्राश्वलितमृदुरजोप्युकटांशारनेजः॥
हत्वाभूलाकृमनंमलिनयतिमांतकीमतत्पुरास्तादुकर्षभुक्तापरस्याकृमयनवरपतमंडलिकस्यातयां॥२०॥ तानुर्वेतरावधसः सुरगधिरतंडुमानूधत्यसुग्राशलकैरका
दुदृष्यपुषश्चकेपमाजन्मतः॥ सत्पुत्रन्यपुत्रसयाकुलहादादानकनिस्मातनोः॥ दृष्टामंडलिकमनोन्नभवतास्त्रयाभविष्यनृकथं॥२१॥ इतिश्रीराज्यवंशवर्णनं॥
अथश्रीशाणवर्णन॥ अस्तिस्वस्तिनिधिश्रीयानिरवधिग्रमासपदंसवधिश्रीधर्म्मस्यवसुधातलभवभूमालिस्फुरन्मंडनंधाणीकूपतटाकदानमजीनशासारशेषालयं॥

* N.B. The above is taken from a Stone near Nimanath's temple. The date on which is Samvat 1339 Jyeshta, Shudh 7. On another Pillar there is given the date Samvat 1333.

The date of this Inscription is 1115 Chaitra, Shudh 7 which Capt.n Jacob supposes a mistake for 1215. 8vo

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JANUARY—1842.

ART. I.—*Inscription on a block of black stone to the left of the eastern entrance of Ray Khimgàr's Mahal at Girnar. Communicated by Capt.* LE GRAND JACOB, *translated by* BALL GANGADHAR SHASTRI, Esq.

The first verses of this inscription have baffled the endeavours of the translator to understand them: with regard, to the whole he has attempted to give a literal translation; but he offers to the public the sense as he has understood it. Under such circumstances some will perhaps consider that we have not acted wisely in publishing it. But when it is considered that the Indian history of Guzerat is in much obscurity, and that monumental testimony to history is of the utmost value, we hope that the publication of such fragments will stimulate the zeal of our correspondents to greater exertions. We take this opportunity of mentioning that our museum possesses coins of only four of the Indian Sovereigns of Guzerat. One is new. No doubt some of our friends will furnish us with the means of examining what has already been accomplished in the sister presidency for us; in order that we also may do our part to facilitate research.

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4. Let us praise Ambicá, whose fame has spread through the universe; and whose son conquers elephants in the form of obstacles, and like Mácaudaja plant, grants and fulfills the petitions addressed to him. 5. Let us sing of the famous lord of mountains — and the gods of whom Indra is the chief, will attend the men who are busy

in the practice of pious rites and virtue. 6. That king of mountains —Raivat, incomparable ornament to the kingdom of Saráushtrá, embellished by various places of sanctity, gardens, rivers, forests, delightful places, and numberless other conveniences provided by kings. 7. Do not, O mountain of the gods! indulge vanity; for how many like the sun, and moon, the creators of delight, are not set to revolve by thee? There shines with glory, one mountain, Raivat, by the sight of which human beings laying aside all the revolutions of the heart(distresses or doubts) attain supreme felicity, happiness, and prosperity. 8. On this mountain is established the race of Hari, whose branches extend far and wide, (which) is the depository of the grandeur of the gods; and the pure offspring of which Achyut, Bala and others, being themselves freed from sin, shed pure influence over others. 9. In this race of the younger chief of Yadus, distinguished for formidable bravery, there was a famous family known as Yadavas, overflowing in streams of virtues, in which flourished Mandalika, before whose feet bowed all kings, and who constructed the temple of Nemi with large golden leaves. 10. There was the king Navaghana, the son of Dípa, who delighted in the assembly of venerable men; pleased his subjects with showers of rain descending from youthful clouds; had eyes like Sarasa (bird) and was amiable by his reputation. 11. Mahipala Deva was the lord of the earth, whose royal son was Dipada —whose slavery was accepted by the law of the gods and the desire—yielding tree of heaven. He was the maker of the edifice of Somanátha in Prabhása. 12. There was also Khangára, lord of the earth, who was a Khangára (fire) on the tree of the enemy's dominions, adorned the prosperity of his royal house; and served as a stream of water poured by a golden vase over the Mundane plant. 13. The king Shrí Jayadeva Sinha, whose eyes were moistened and intoxicated with the stream of the enjoyment of the bright pleasures afforded by earth; the magnitude of whose glory dazzled the enemies; and whose feet were washed by the fluid radiating from the gems on the brilliant crowns of kings who humbled themselves before them. 14. After him flourished Makala Sinha, the lion in destroying the elephants in the form of enemies; whose glory was partaken by the sun; and who shone like a beautiful Hansa on the lotus-like mind of the virtuous. 15. After him was born king Melagadeva, who acted like a black-bee on the lotus-like feet of Bhava (Mahadeva, and was possessed of excellent personal accomplishments. (A foot is here omitted). 16. There was, king Mahipáladeva, wonderful with

the glory shining over his feet which resembled the brow of Udaya, the eastern hill; who shone over other kings, overcome by tributes that had been imposed upon them; as the sun shines over mountains illuminated by his rays spreading in all directions; who destroyed the hostile kings, and resembled the sun; who expels darkness in destroying the gloom of immorality. 17. His son Mandalika shines and creates terror to enemies as a lion to elephants. His fame having plunged in the heavenly rivers, has crossed the circuit of the oceans. 18. There flourished after him Mandalika, under whom kings of kings had taken refuge. (The rest of this verse is inaccurate.)

19. The arm of Mandilika is resplendent — a time post of the elephant like victory, the bridge of the ocean of happiness, the moon emanating from the churning of the ocean of bravery, the eastern halo of the rays of glory, the mitigator of widowhood to the queens of his enemies. 20. O hostile kings! I could give you some good advice. Look, what is before you. This is the dust agitated by the foot steps of the horses of Mandalika, which overspreading the earth cast a gloom over all. O! leave off rashness and accept the service of Mandalika. 21. It is but a display of the wisdom of Brahma that he has created the Divine cow, the gem, and the trees of rough and woody structure; for having seen Mandalika so devoted to liberality, what occasion can there be for producing them?

ART. II.—*Inscriptions from Palitana.*

No. II. Inscriptions recording the benefactions of the Emperor Akbar to Palitana and to the Jains.

ओंनमः श्रेयस्वीप्रथमःप्रभुः प्रथिमभागोनेनपुण्यात्मनामस्तुस्वस्तिकरः सुखाब्धिमकरःश्रीमारुदेवःसवः पद्मोल्लासकरःकरैरिवरदिर्व्योम्निक्रमांभोरुह न्यासैर्यस्तिलकूबभूवभगवान्शत्रुंजयेनेकशः १ श्रीसिद्धार्थनरेशवंशसरसीजन्माब्जिनीवल्लभः पायाद्वःपरमप्रभावभवनश्रीवर्द्धमानप्रभुः उत्पत्तिस्थितिसंहतिप्रकृतिवाग्यद्वौर्जगत्पावनी खर्वापीवमहाव्रतप्रणयभूरासीद्रसोल्लासिनी २ आसीद्दासवबृंदवंदितपदद्वंद्वःपदंसंपदां तत्पट्टांबुधिचंद्रमागणधरः श्रीमान्सुधर्माभिधः यस्यौदार्ययुताप्रहृष्टसुमनाअ-

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१ रदि read रवि, कू read क, व read वः
२ पायाद्वः read पायाच्छः खर्वापीव read ख र्वापी

द्यापिविद्यावती धत्तेसंततिरुन्नतिंभगवतोवीरप्रभोगौरिव ३ श्रीसुस्थितः सुप्रतिबुधपत्तौ सूरीअभूतांतदनुक्रमेण याद्भ्यांगण्यो ४भूदिहकौटिव्हं चंद्रार्यमभ्यामिवसुप्रकाशः ४ तत्राभूद्वज्रिणांवंद्यः श्रीवज्रर्षिगणाधिपः मूलंश्रीवज्रशाखाया गंगायाहिमवानिव ५ तत्पट्टांबरदिनमणि रुदितःश्रीवज्रसेनगुरूरासीत् नागेंद्रचंद्रनिर्वृति विद्याधरसंज्ञिकाश्चतछिष्याः ६ स्वस्वनामसमानानि येभ्यश्चत्वारिजज्ञिरे कुलानिकाममतेषु कुलंचांद्रंतुदिद्युते ७ भास्कराइवतिमिरं हरंतःख्यातिभाजनं भूरयस्तत्र (बहवो) जज्ञिरेजगतांमताः ८ बभूवुःक्रमतःसूत्रश्रीजगच्चंद्रसूरयः यैस्तपाभिरुदंलेभे बाणासित्था ६र्क १२८५ वत्सरे ९ क्रमेणास्मिन्गणेहेमविमलाःसूरयोभवन् तत्पट्टेसूरयोभूवन्नानंदविमलाभिधाः १० साध्वाचारविधिः पथः शिथिलितः सम्यक्श्रियांधामयै रुद्धध्रेस्तनसिद्धसायकसुधारोचिर्निभे १५८२ नेहसि जीमूतैरिवयैर्जगत्पुनरिदंतापंहरत्भिर्भृशं सश्रीकंविदधेगवांश्रुवितमैः सोमैरसोल्लासिभिः ११ पद्माश्रयैरलमलंक्रियतेस्मतेषां प्रीणन्मनांसिजगताकमलोदयेन पट्टःप्रवाहइवनिर्जरनिर्झरिण्याः शुद्धाम्नभिर्विजयदानमुनीशहांसैः १२ सौभाग्यंहरिसर्वगर्वहरणंरूपंचरंभापति श्रीजैत्रंशतपत्रमित्रमहसांचौरंप्रतापंपुनः येषांवीक्ष्यसनातनंमधुरिपुस्वःस्वामिघर्मांशवो जाताःकाममपित्रपाभरभृतोगोपत्वमाप्तास्त्रयः १३ तत्पट्टः —कटःप्रकामकलितोद्योतस्तथासौधवत् सच्चैर्यविराजहीरविजयस्नेह— यैनि—मे सौभाग्यंमहसांभरेणमहतामत्यर्थमुल्लासिनां बिभ्राणःसयथाजनिष्टसदृशांकामप्रसादास्पदं १४ देशाद्गुर्जरतोथसूरिवृषभाआकारिताः सादरं श्रीमत्साहिअकब्बरेणविषयंमेवातसङ्गंशुभम् प्रा——जपाणयोवतमसंसर्वहरंतोगवां स्तोमैःसूत्रितविश्वविश्वकमलोल्लासैर्नभोकांइव १५ चक्रुः

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१ पद् read पदं

४ अभूता read अभूतां, याद्भ्यां read याभ्यां, मभ्यां ८: should be omitted

९ खपां भिरुदं read विरुदं खपो १२ In lacuna supply र

१५ in lacuna supply श्चांद्

फतेपुरम ——— भीम दृग्युग्मकोककुलमाप्तसुखंसृजंतः अष्टैकपावक-
नृपप्रमिते १६३९ स्वगोभिः सोल्ला ——— बुजकाननंये १६ दामेवाखि-
लभूपमूर्द्धसुनिजामाज्ञांसदाधारयत्श्रीमान्शाहिअकब्बरोनरवरोदेशेष्व--
शेषेष्वपि षण्मासाभयदानपुष्टपटहोदूघोषानघध्वंसिनः कामंकारयति-
स्महृष्टहृदयोयद्वाकुलारंजितः १७ यदुपदेशवशेनमुदंदधन्निखिलमण्ड-
लवासिजनेनिजे मृतधनंचकरंचसुजीजिआभिधमकब्बरभूपतिरत्यजत्
१८ यद्वावाकृतकाभयाविमलितस्वांतांबुपूरःकृपा पूर्णःशाहिरनिंद्यनी-
तिवनिताक्रोडीकृतात्मात्यजत् शुल्कं त्यक्तुमशक्यमन्यधरणीराज्ञांजन-
प्रीतये नद्वान्नीडजपुंजपूरपशूंश्चामूमुचद्भूरिशः १९ यद्वाचांनिचयैमु-
धाकृतसुधाधारैरमंदैःकृता ल्हादःश्रीमदकब्बरःक्षितिपतिः संतुष्टिपुष्टा-
शयः त्यक्त्वातत्करमर्थसार्थमतुलंयेषांमनःप्रीतये जैनेभ्यः प्रददौचतीर्थ-
तिलकंशत्रुंजयोर्वीधरं २० यद्वाग्भिर्मुदितश्चकारकरुणास्फूर्जान्मनाःपौ-
स्तकं भांडागारमपारवाङ्मयमयंवेश्मेववाग्दैवतं यत्संवेगभरेणभावितमतिः
शाहिःपुनःप्रत्युहं पूतात्मावहुमन्यतेभगवतां दर्शनम् २१ यद्वावातरणि-
त्विषेवकलितोल्लासंमनःपंकजं बिभ्रच्छाहिअकब्बरोव्यसमधिपाथोजिनी-
चंद्रमाः जज्ञेश्राद्धजनोचितेश्वसुकृतैः सर्वेषुदेशेष्वपि ख्यातोर्हतभक्तिभावि-
तमतिः श्रीश्रेणिकक्ष्मापवत् २२ लुंपाकाधिपमेघजीऋषिमुखाहित्वाकु
मत्याग्रहं भेजुर्यच्चरणद्वयीमनुदिनंभृंगाइवांभोजिनीं उल्लासंगमितायदी-
यवचनैर्वैराग्यरंगोन्मुखे र्जाताः स्वस्वमतंविहायबहवोलोकास्तपासंज्ञका-
२३ आसीच्चैत्यविधापनादिसुकृतक्षेत्रेषुवित्तव्ययो भूयान्यद्वचनेनगुर्जरध-

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१६ in lacuna supply वाप्त सुखाति, अष्टे read वर्षे, in lacuna supply समादधुरथां

१७ the lacuna appears erroneous, ध्वसि read ध्वंस.

१८ lacuna appears superfluous.

१९ lacuna should be omitted.

२० in first lacuna supply धारै

रामुख्येषुदेशेष्व६लं याशंगूर्जरमालवादिकमहादेशोद्भवैर्भूरिः संघैःसा-
द्धंमृषीश्वराविदिधिरेशत्रुंजयेयेगिरौ २४ तत्पट्टमब्धिमिवरम्यतमंसृजंतः
स्तोमैर्गवांसकलसंतमसंहरंतः कामोल्लसत्कुवलयप्रणयाजयंतिस्फूर्जत्कला-
निजयशेनमुनींद्रचंद्राः २५ यत्प्रतापस्यमाहात्म्यंवर्ण्यतेकिमतःपरं अस्वप्ना-
श्चक्रिरेयेनजीवंतोपिहिवादिनः २६ सौभाग्यंविषमायुधात्कमलनीकांता-
च्चतेजस्विता मैश्वर्यंगिरिजापतेःकुमुनीकांतात्कलामालितां माहात्म्यंधर-
णीधरान्मखभुजांगांभीर्यमंभोनिधेरादायांबुजभूःप्रभूः प्रविदधेयन्मूर्तिमे-
तन्मयां २७ येचश्रीमदकब्बरेणविनयादाकारिताःसादरं श्रीमल्लाभ-
पुरंपुरंदरपुरंव्यक्तंसुपर्वौकरैः भूयोभिर्वातिभिर्बुधैःपरिवृतोवेगादलंचक्रिरे
सामोदंसरसंसरोरुहवनंलीलामरालाइव २८ अर्हंतंपरमेश्वरत्वकलितंसं-
स्थाप्यविश्वोत्तमं साक्षात्साहिअकब्बरस्यसदसिस्तोमैर्गवामुद्यतैः यैसंमी-
लीवलोचनाविदधिरेइत्यक्षशूरैश्रिया वादोन्मादभृतोद्विजातिपतयोभट्टा-
निशाटाइव २९ श्रीमत्साहिअकब्बरस्यसदसिप्रोत्सर्पिभिर्भूरिभि र्वादैर्वा-
दिचरान्विजित्यसमदान्सिंहैर्द्विपेंद्रानिव सर्वज्ञाशयतुष्टिहेतुरनघोदिश्यु-
त्तरस्यांस्फुरन् यैःकैलासइवोज्वलोनिजयशः स्तंभोनिचख्नेमहान् ३०
दत्तसाहसधीरहीरविजयश्रीसूरिराजांपुरा यछ्रीशाहिअकब्बरेणधरणी-
शक्रेणतत्प्रीतये तच्चक्रेखिलमप्यबालमतिनायत्साजमत्साक्षिकंतत्पत्रंफुर-
माणसंज्ञमनघंसर्वादिशोव्यानशे ३१ किंच गोवृषभकासरकांता कास-
रायमगृहंनहिनेयाः मोच्यमेवमृतवित्तमशेषबंदिनोपिहिनचग्रहणीयाः३२
यत्कलासलिलवाहविलासपीतचित्ततरुणाजनतुष्ट्यै स्वीकृतंस्वयमकब्बर-
धात्रीस्वामिनासकलमेतदपीह ३३ चोलविगमनंदनेनवसुधाधीशेनस-
न्मानिता गुर्वीगुर्जरमेदिनीमनुदिनंस्वर्लोकबिब्बोकिनीम् सद्वृत्तामहसांभरे-
णसुभगागाढंगुणोल्लासितो येहाराइवकंठमंबुजदृशांकुर्वंतिशोभास्पदं ३४

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२४ for भूरि : read भूरिभिः

२७ for ब्जमलनी read कमालिनी, प्रभूः read प्रभुः

२९ मंमीलीव read ममीलित.

No. III. Inscription commemorating the benefactions of the goldsmith Téjpal to the temple of Palitana.

इतश्च आभूरान्वयपद्मप्रसवयाउकेसवंशेभव[1] श्रेष्टीश्रीशिवराजइत्य
भिधयासौवर्णिकःपुण्यधी[2] तत्पुत्रोजनिसीधरश्चतनयस्तस्याभवत्पर्वतः का-
लाव्होजनितःसुतश्चतनुजस्तस्यापिवाधभिधः ३५ तस्याभूद्दळिआभिधश्च
तनुजःख्यातोरजाइ[3]भव तस्याभूच्चसुहासिनीतिगृहिणीपद्मेवपद्मापते[4]र्णीसु
रराजयोरिवजयःपुत्रस्तयोश्चाभवत्तेजःपालइतिप्रहृष्टसुमनाःपित्रोर्मनः प्रीति
कृत् ३६ कामस्येवरतिर्हरेरिवरमागौरीवगौरीपतेरासीत्तेजलदेइतिप्रियत-
मातस्य[5]कृतिः भोगश्रीसुभगौगुरौप्रणयिनौशश्वत्सुपर्वादरौपौलीमीत्रिद
शेश्वराविवसुखंतौदंपतीभेजतुः ३७ वेराग्यवारिनिधिपूर्णानिसाकराणां
तेषांवहीरविजयव्रतिसिंधुराणां सौ[6]भाग्यपरभागविभासुराणां तेषांपुन-
र्विजयसेनमुनीश्वराणां ३८ वाग्भि[7]र्मुधाकृतसुधाभिरुदंविचेत्ताः श्राद्धः
सशोभनमनाभजतिस्मभावं श्रीसंघभक्ति[8]नदानजिनेंद्रचैत्यो द्धारादि-
कर्मसुभृशंसुकृतिप्रियेषु ३९ विशेषकं॥ ग्रहैःप्रशस्तेर्हिसुपार्श्वभर्तु रनं-
तभर्तुश्चशुभांप्रतिष्टां सोचीकरत्षड्युगनृप[9] १६४६ वर्षे हर्षेणसौवर्णि-
कतेजपालः ४० आदावीर्षभिरत्नतीर्थतिलकेशत्रुंजये ६चीकर[10]त्सैत्यं
शैत्यकरंदृशोर्मणिगणस्वर्णादिभिर्भासुरं अत्रान्येपिभुजार्जितांफलवतीमु-
च्चैःसृजंतःश्रियं प्रासादंतदनुक्रमेणवद[11]श्राकारयन्भूभुजः ४२ तीर्थे-
त्रसाधुकरमाभिधेधनीसिद्विसिद्वितिथि १५८८ संख्ये॥ चैत्यमचीक-
रदुक्ते रानंदविमलमुनीराजां ४३ तंवीक्ष्यजीर्णेभगवद्विहारंसतेजपालः
स्वहृदीतिदध्यौ भावि[11]कदासौ ६वसरोवरीयान् यत्रा ६त्रचैत्यंभवितानवीनं
४४ अन्येद्युःस्वगुरु[12]पदेशशरदाकामंवलक्षीकृता[13] स्वातंभाःसवणिग्वरः

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१ भवः २ धीः ३ इंभवः ४ इंद्राणी
५ प्रसन्नाकृतिः ६ सौभाग्यरूप ७ मुधा ८ धन
९ भूप १० चैत्यं ११ भावी १२ गुरु
१३ स्वांताभाः

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पुरतरेश्रीस्तंभतीर्थेवसन् तीर्थश्रीमतितुंगतीर्थतिलकेशत्रुंजयेर्हद्गृहे द्वारंक-
र्तुमनाअजायततमांसाफल्यमिछञ्श्रियः ४५ अत्रस्यात्सुकृतंकृतंतनुमतां
श्रेयः श्रियांकारणं मत्वेवंनिजपूर्वजव्रजमहानंदप्रमोदाप्तये तीर्थश्रीविमला-
चलेतिविमलेमौलेर्हतोमंदिरे जीर्णोद्धारमकारयत्सुकृतीक्रंतीतनुज[1]न्मवत्
४६ शृंगेणभिन्नगगनांगणमेतदुच्चै श्वैत्यंकास्तिशिखरासि[2]तहेमकुंभं ह-
स्तेषु ५२ हस्तामितमुच्चमुपैतिनाक लक्ष्मींविजेतुमिवकाममखर्वगर्वं
४७ यत्रार्हदोकसिजितामरकुम्भिकुंभाः कुंभाविभांतिशरवेदकरेंदु-
१२४५ संख्याः किंसेवितुंप्रभमगुःप्रचुरप्रताप पूरैर्जितादिनकराःकृतनै-
करूपाः ४८ उन्मीलितप्रदभूमिरुहानशेषान् विश्वेषुविघ्नकरिणोयुगपन्नि.
हंतुं सज्जास्मइत्थमभिधातुमिवेंदुनेत्रा[3] २९ सिंहाविभांन्युगताजितधाम्नि-
यत्र ४९ [4]यागिन्योयत्रशोभंते चतस्रोजितवे[5]श्मनी निषेवितुम[6]वाक्रां-
ताः प्रतापो[7]रागतादिशः ५० राजंतेचदिशांपाला[8]—यत्रा६र्हदाल-
येमूर्त्तिमंतः ष्किं[9]मायाता धर्मा[10]त्संयमिनाममी ५१ द्वासप्ततिः श्रियम-
यंतिजिनेंद्रचंद्रबिंबानिदेवकुलिकासुवितावतीषु[11] द्वासप्ततेःश्रितजिना-
लिकलालतानां किंकुड्मला[12]ष्यरिमलैर्भुवनंभरंतः ५२ राजते-
यत्रचत्वारोगवाक्षाजिनवेश्मनि विरंचेरिववक्त्राणि विश्वकारणहेतवे
५३ यत्रचैत्येविराजंतेचत्वारश्चतपोधनाः अमीधर्माःकिमायाताः प्र-
भुपार्श्वेवपुर्भृतः ५४ पं[13]चालिकाःश्रियमयंतिजिनेंद्रधाम्नि[14] द्वात्रिंश-
दिंद्ररमणीभरजैत्ररू[15]पाः ज्ञातापतीनिहजिनेकिमुलक्षणक्ष्मा राजांप्रिया-
निजनिजेशनिभालनोक्ताः ५५ द्वात्रिंशदुत्तमतमानिचतोरणानि रा-
जंतियत्रजिनधाम्निमनोहराणि किंतीर्थकृद्दशनलक्ष्मी[16]मृगेक्षणाना मं-

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१ Doubtful.
२ स्थितं
३ नेत्राःसिंहाविभांत्युपगता
४ योगिन्यो
५ जिनवेश्मनि
६ शिवा
७ मागता
८ पाल्लाःशुभे
९ तःकिमायाता
१० धर्माः
११ Doubtful.
१२ लाः परिमलैर्भु
१३ पांचालिकाः
१४ धाम्नि
१५ रूपाः
१६ लक्ष्मी

दोलनानिसरलानिसुशनानि ५६ गजाश्चतुर्विंशतिरद्रितुंगा विभांतिशभ्राजिनधाम्नियत्र दवाश्चतुर्विंशतिरीशभक्त्यैकिमागताः कुंजररूपभाजः ५७ स्तंभाश्चतुःसप्ततिरद्रिरा जातुंगाविभांतीहजिनेंद्रचैत्ये दिशामधीशैः सहसर्वइंद्रा किमाप्तभक्त्यैसमुपेयिवांसः ५८ रम्येनंदपयोधिभूपति १६४९ मितेवर्षेसुखे नकृत् साहाय्याद्भुजसुठक्कुरस्यसुकृतारामैकपाथोमुचः प्रासादंबलिभासुतेनसुधियाशत्रुंजयेकारितं दृष्ट्वा ऽष्टापदतीर्थचैत्यतुलितंकेषांनचित्तेरतिः ५९ चैत्यंचतुर्णामिवधर्ममेदिनी भुजांगृहंप्रीणितविश्वविष्टपम् शत्रुंजयोर्वीभृतिनंदिवर्धना ऽभिधंसदायछत्रांछितानिवः ६० भूयः प्रभाभरविनिर्मितनेत्रशैत्य चैत्ये ऽत्रभूरिर ऽभवद्विभवव्ययोयः ज्ञात्वावदंतिमनुजाइतितेजपालं कल्पद्रुमत्ययमनेनधनव्ययेन ६१ शत्रुंजयेगगनबाणकला १६५० मितेब्दे यात्रांचकारसुकृतायसतेजपालः चैत्यस्यतस्यसुदिनेगुरुभिः प्रतिष्ठा चक्रेवहीरविजया ऽभिधसूरिसिंहैः ६२ मार्तंडमंडलमिवांबुरुहीसमूहः पीयूषरश्मिवनीरनिधेःप्रवाहः केकिव्रज : सलिलवाहमिवातितुंगंचैत्यंनिरीक्ष्यमुदमेतिजनःसमस्तः ६३ चैत्यंचारुचतुर्मुखंकृतसुखंश्रीरामजीकारितं प्रोत्तुंगंजसुठक्कुरेणविहितंचैत्यंद्वितीयंशुभं रम्यंकुंअरजीविनिर्मितम ऽभूचैत्यंतृतीयंपुन र्मूलश्रेष्टिकृतंनिकामसुभगंचैत्यंचतुर्थंतथा ६४ एभिर्विश्वविसारिभिर्द्युतिभरैर ऽत्यर्थसंसूत्रितोद्योतोदिक्ष्वखिलासुनिर्जरपतिः स्वर्लोकपालैरिव श्रीशत्रुंजयशैलमौलिमुकुटंचैत्यैश्चतुर्भिर्युतः प्रासादो ऽगिमनोविनोदकमलाचैत्यंचिरंनंदतु ६५ वस्ताभिधस्यवरसूत्रधरस्यशिल्पं चैत्यंचिरादिदमुदक्ष्यनिरीक्षणीयं शिष्यत्वमिछतिकलाकलितोपिविश्वकर्मास्यशिल्पपटलेभवितुंप्रसिद्धः ६६ सदाचराब्धीनांकमलविजया-

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९ दर्शं १० Doubtful ११ राजोतुंगा
१२ इंद्राः १३ सुखानंदज्ञत
१ द्रुमात्यय २ कुञ्जरजी ३ अभूचैत्ये
४ प्रासादोऽभि

व्हानसुधियां पदद्वंद्वांभोजभ्रमरसदृशोहेमविजयः अलंकारैराढ्यांस्त्रिय-
मिवशुभांयांविहितवान् प्रशस्तिःशस्तैषाजगतिचिरकालंविजयतां ६७ इ-
तिसौवर्णिकसाहश्रीतजपालोत्धृतविमलाचलमंडनश्रीआदिशमूल प्रासाद-
प्रशस्ति : श्रेयःबुधसहजसागराणां विनेयजयसागरोलिख[1]वर्णै शिल्पिभ्या-
मुत्कीर्णामाधवनानाभिधानाभ्यां ॥ श्री ॥ ६८ ॥ छ् राम् ।

ART. III. — *An Essay on the Language of the Aboriginal Hindus.* BY THE REV. DR. STEVENSON.

After carrying the study of the languages of continental India and the island of Ceylon to some extent, the student is apt to imagine that they are all mere corruptions of the Sanscrit, the language of the literature and religion of the Brahmans. A more critical examination of the subject, however, at last convinces him, that there are many words in common use, especially in the languages of Southern India, that cannot, after making every allowance for corruption, be derived from the Braminical tongue. He also finds that a great many of the words derived from the Sanscrit are used only by Brahmans, while others of the same meaning, but of a different origin, are constantly substituted by the common people. He farther observes that there are several Sanscrit letters which are never introduced into the spoken languages of India, or which if introduced, none but Brahmans can pronounce. Thus ऋ (ri) is by the common people always converted into रि (ri), or रु (ru), and the next three letters never enter into any of the spoken dialects; श (sh) and क्ष (ksh) are changed to ख (k), ख (kh), or स (s). Innumerable combinations of letters, such as ष्ट (sht), क्र (kr), र्म (rm), &c. are uniformly deprived of one of their members, or have a vowel interposed between the two consonants; and in the south of India several letters are used that are not found in Sanscrit. It is true that in all countries the pronunciation of the vulgar differs from that of the educated, but this difference usually appears least in the most characteristic sounds of a language. Thus in English the two sounds of *th* in *that* and in *thin*, both unutterable to a German or a Frenchman, are yet enunciated as correctly by every peasant, as by any lord; while no instruction can teach the uneducated adult, the polite pronunciation of the *m* in *aid de camp*,

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[1] लिखवर्णैः

or of the *n* and *oi* in *sansfroide*; words which belong only to the language of the higher classes in England, while on the other side of the channel they may be heard flowing with all their peculiar grace from the mouth of every peasant.

The existence of all of these circumstances, suggests the enquiry whether the words entirely foreign to the Sanscrit are mere vulgar terms, used at random in every particular province, without any connection with those used in other provinces, or whether they are the same or nearly so, in all the different spoken languages of India. A connection has indeed by many been shewn to exist among the northern languages, and their relation to each other traced; and the same has been done in reference to the languages of the South. I am not aware however that the boundary line has been crossed, and the relation between the northern and southern family traced any farther than to shew that the Sanscrit enters largely into them all. That part of these languages, which is not derived from the Braminical tongue, has never been traced through the spoken languages of India. Yet if we can trace a language wholly different from the Sanscrit in all the modern dialects, after separating also the easily recognized importations by the Mahomedan conquerors of India, it will seem to follow, that the whole region previous to the arrival of the Brahmans was peopled by the members of one great family of a different origin. That family may have been divided into different branches; one of these may have preceded the other in their migrations, yet oneness of language would seem to point to oneness of origin, especially since both history and tradition are silent as to any wide spread influence exercised in ancient times, by any foreign tribe except the Braminical. I call the Brahmans a foreign tribe in accordance with indications derivable from the cast of their features, and the colour of their skin, as well as from their possessing a language which none of the natives of India but themselves can even so much as pronounce; and the constant current of their own traditions, making them foreign to the whole of India, except perhaps a small district to the north-west upon the Ganges. Even in the time of Manu, the whole country to the south of the Vindhya mountains and Nerbudda river, was inhabited by men who did not submit themselves to the Braminical institutions, and among whom he advises that no Brahman should go to reside.

Our enquiry then is in reference to the language spoken by these aboriginal Hindûs, before they were subjected to Braminical influence

Of this we mean to collect a few fragments yet to be found in all, or nearly all the present spoken languages of India. It may be necessary first of all, however, to state more explicitly that these languages, like those of modern Europe, may be divided into two great families, a northern, and a southern. The members of the northern family, while differing essentially from the Sanscrit, and agreeing with the southern in general grammatical structure, borrow most of their vocables from the Braminical tongue. The Hindí, which probably contains the most, is estimated by Mr. Colebrooke to have nine-tenths of its vocables of Sanscrit origin, and the Maráthi which contains the fewest has at least four-fifths of its words derived from the same source. In the southern family again, Sanscrit words are of rarer occurrence and enter less into the common language of the people, except in the Singhalese, which from the influence of the Páli, chiefly derived from the Sanscrit, and the language of the Budhistical literature, has nearly as many words originally derived from the Sanscrit as the Hindí itself.

The northern family may be considered as embracing the Hindí, with its dialects of Panjábí, Brij Bhásha, and Hindostání; the Bengálí; the Gujaráthí; the Márwárí; and the Maráthí. The Uríyá may be considered as a connecting link between the two families, though inclining perhaps somewhat to the Northern. The Southern family, is generally said to consist of the Telinga or Telugu, the Canarese or Carnática, the Tamil, and the Malayálim. There are however besides these, two other languages spoken in small districts on the Malabar Coast, the Kokaní inclining to the northern, and the Tulu belonging decidedly to the southern family. The Singhalese also may be considered as a branch of the latter family, as well as the language of the Maldive islands.

The allied languages of Cutch, Scinde, and Affgháuistan are plainly derived from the same original as the languages of India, though now abounding more or less with Persian vocables. The Nepalese, an Indian language, connects the languages of India with that of Tibet; and the Assamese another, forms the link between them and the language of Burmah. The numerous rude tribes inhabiting the hills and forests of India, have each a language of their own, of some of which small lists of words only have hitherto been published. The languages of the Malayan peninsula, and of Java, and the adjacent isles, though containing many words of Indian origin, are probably indebted for them to Indian traders, conquerors, legislators, and di-

vines, to whom the inhabitants owed, in ancient times, their civilization and literature. I have not the materials to enable me to embrace the whole of this extensive range of languages, and must confine myself chiefly to the Hindí, Bengalí, Gujáráthí, Maráthí, Telugu, Carnática, Támil, and Singhalese. Yet if it be considered that these are the languages of at least nine-tenths of the inhabitants of India, and will carry us in one unbroken line from Dondra head to the Himalayan mountains, and again in another line from the Brahmaputra river to the banks of the Indus; we cannot err much in applying conclusions drawn from them to the other languages of the plains, confessedly so similar in their vocabulary and construction to one or other of them. Larger and more numerous catalogues of the words used by the hill tribes would require to be compared with one another; and with the languages of the inhabitants of the plains, before any certain conclusions can be drawn from them. In those already published there is rather a striking resemblance to the languages of the Indian peninsula. Should I be favoured with catalogues of the languages of more of these tribes, I may probably again resume this subject in reference to them; and I am sure the conductors of our journal would welcome such contributions made by any, who have opportunities of furnishing them for publication.

I. There is then a great resemblance in the grammatical structure of the abovementioned eight languages.

1. In the inflection of nouns.

All are deficient in the number of cases required to mark the different relations of nouns, and supply the deficiency by particles, placed after the root or some of the cases.

In the letters that characterize the principal cases, there are several striking analogies running through most of the languages. Thus the letter *n* is a very general characteristic of the Genitive Singular. It enters into the Gujaráthí common genitive नो नी नु (*no ni nun*); the ancient Marathi genitive चेनी (*cheni*), now usually contracted into चे (*che*); and into the Tamil ऽन (*in*); in all of which it runs through all the declensions. It is found also in the नि (*ni*); of the first of the three declensions in Telugu, and in the अन and ऽना (*ana* and *ina*) of the first and fourth of the four Canarese declensions. It is singular that in the Turkish the termination of the genitive *ung* should afford so near a parallel to the above; and that we should have the remains of such a genitive singular in *mine*, and *thine;* and the Germans in *mein*, *dein*, and *sein*. Again the letter *k* enters extensively

in these languages into the Dative Singular; Thus we have in Hindí को (*ko*), in Bengali কে (*ke*), in Telugu generally కు (*ku*), in the Canarese second declension ಕ್ಕೆ (*kke*), and in the Tamil கு (*ku*). The Hindí Genitive in का को के (*ká kí ke*) may be a contraction of the Telugu యొక్క (*yokka*); and the common change of క to గ gives us nearly the Singhalese ගෙ (*gai*), and the Tibetan གྱི or གེ (*gye* or *ge*). The Marathi ला (*lá*) of the Dative is the same as the Afghan لا (*lá*) used for pronouns, and nearly the same as the Tibetan ལ (*la*). The simple lengthening of the short अ of the Nominative into आ in Marathi, for the Dative and Accusative as is common in the ancient dialect, is the same process as that frequently employed in the Singhalese for the formation of the Accusative. The common Dative in the Singhalese is ට (*ta*); and in Pashtu ته (*ta*); and in the old Marathi dialect, the Accusative frequently, and sometimes the Dative is formed by the termination ते (*te*). In none of these instances is there an agreement with the Sanscrit, and coincidences so numerous and so minute, could scarcely result from mere accident, and therefore are probably the remains of the language spoken by the Hindus before they came in contact with the Brahmans; in which the affixed particles marking the relation of nouns were probably like our prefixed words *for*, *with*, *concerning*, all significant when separated, and the varieties now discoverable have been produced by the dropping in one language one syllable, and in another, another. That this is not mere theory may be seen in the old form of the Maráthí Dative, लागीं (*lágí*) derived from the verb लागणे (*lágane*), to come in contact with; where we have their present Dative, and that of the Pashtu pronouns, and the Dative in the Tibetan language in the first syllable ला (*là*); and in the second syllable the common Dative in Canarese, by simply changing the vowel into that with which it is most often interchanged, giving us गे (*ge*); and by changing the consonant into its sharp we have the कि (*ki*) of the Telugu, and the chain of the analogy with the other languages mentioned above, established. That this word लागीं (*lágí*) itself may be derived from the Sanscrit, is no objection whatever; for it may have been derived from a root common to many languages, and be just as independent of the Braminical tongue as our own word *lug*.

2. In turning from the noun to the verb we observe that the second person singular Imperative is the root, or shortest form to which the verb can be reduced; the letters of which in regular verbs appear

in all the Moods, Tenses, and Persons. This is so common in other languages that I should hardly have noticed it, had it not been that it takes place after every allowance, in only about one half the conjugations and half the tenses in Sanscrit.

3. The Present Tense in common use in them all, contains the Present Participle, as a constituent part of it. In the Singhalese, Telugu, Carnatica, and Tamll, that is in the southern family, the Present Participle Active receives the signs of the persons as affixes, to form the Present Indicative. In the northern family generally I believe, as in the Hindi, and with a Negative in Gujarathi, the Present Tense is formed by the participle, and the Substantive Verb as in our form *I am reading*. In the Marathi, both forms are used according to the sense.

4. All of these languages, unless perhaps the Singhalese, agree in using an aorist, which denotes, Past, Present, or Future time, as the sense requires. In many of them, however, it is mainly confined to the ancient dialect, and only used in popular speech, as explained under the next head.

5. To the abovementioned aorist a Negative Particle may be affixed, so as to form what is called the Negative Verb. In the northern family the ना or न (*nà* or *na*), which expresses the negation is affixed to the signs of the persons, and never disappears. In the southern family on the contrary, the sign of the negation intervenes between them and the root of the verb, so that the अ (*a*) which was probably the original sign of negation, is in some of them, as the Canarese, entirely lost, and this negative verb becomes shorter than the affirmative. In the Japanese and Turkish languages, which follow the same plan the *n* or *z* in the former, and the *m* in the latter never disappear; and even in the Tamil, the lengthening of the vowel before the signs of the persons, gives notice of the presence of the Negative Particle. To the observations under this head the Singhalese seems an exception, having no affix which it adds to the verb to deny the existence of the act.

6. In all of these languages the Past Tense of the Verb is marked by affixes and not prefixes as in the Sanscrit. In the Canarese the common sign is द (*d*), agreeing with the Turkish; and in one dialect of Gujarathi it is ध (*dh*). In the Tamil it is त or द (*t* or *d*), as in our own tongue. In the Telugu it is always त (*t*) agreeing in this with the German, though the German has also the prefixed reduplication, which allies it to the Sanscrit and Greek. There is one word

common in the ancient dialect in the Marathi, which seems to me to furnish the key to all the discrepancies observable in the formation of the Past Tense in the modern Indian languages. It is the word दिधले (*didhale*), the past tense of the verb दे (*de*) give. In the Southern Gujarathi the ध (*dh*), has been retained, and the ल (*l*), dropped. In the Canarese and other southern languages which abhor aspirates, it has been reduced to द (*d*), or changed to त (*t*). The common Maráthí and Bengálí have dropped the ध (*dh*), and retained the ल (*l*). In the Northern Gujaráthí and Hindí, the liquid ल (*l*), has been changed into its fellow liquid य (*y*), while in Urdu even this is usually dropped. Although only this one word in Maráthí retains the ध (*dh*), pure before ल (*l*), it exists in the corrupted form of त (*t*) in several words of very common occurrence in the language.

7. Almost all of these languages agree in forming an Infinitive of very popular use, by adding the same letters that are used for the formation of the Dative Singular of nouns. The Tamil makes the slight change from கு (*ku*), to க (*ka*). Such a form of Infinitive I need not say is quite unknown in Sanscrit.

8. All of the verbs in these languages are naturally destitute of a Passive voice. Awkward attempts by those who translate from the Sanscrit and European languages, have been made to supply its place by a Past Participle, and the verb *to go* in the Northern, and the verb *to fall* in the Southern family, but such forms never enter into popular speech, except in the neighbourhood of European stations. The natives have various ingenious ways of making up for the want of the Passive and say in their peculiar languages on the Ganges, in Maharástra, and in the Carnatic, *I have eaten blows*, instead of *I have been beat*. When other expedients fail them, instead of saying *it is reported*, they say *people report it*; using the Third Person Plural Active instead of the Passive.

9. In all of these languages, there is a great deficiency of verbs which is supplied in the popular speech by using nouns with the verbs, do, give, take, &c.

10. In the construction of these languages, either the Accusative, as in the Tamil, is occasionally used for the Nominative, or more generally as in most of the other languages the Nominative, especially of nouns denoting things without life, is used for the Accusative, or the Nominative and Accusative are the same; thus all, more or less, frequently disregard the distinction between the two cases.

Such are the most important particulars that my partial acquaint-

ance with several of these languages has permitted me to observe, as running through the whole, or nearly the whole of them, but they are surely sufficient to establish among them a strong family connection; and when it is remembered that for none of these characteristics are they indebted to the Sanscrit, it seems impossible to account for such a similarity of grammatical structure in languages spoken by people having so little intercourse with one another, as for ages the Hindu inhabitants of the north and south of India have had, unless we suppose it to arise from their all being originally of one family, and possessing one primitive language, the grammatical structure of which may be in some measure gathered from these their points of agreement. That Braminical influence has modified the grammatical structure, and introduced into the northern languages some affixes for those in former use, especially in the inflexion of nouns need not be denied; but the general structure of all has certainly remained unaffected, as there is about as much analogy in the construction of a Hindí or Maráthí sentence, to the Syntax of Sanscrit, as there is in that of a French or English sentence, to that of the Latin. Indeed upon the whole there seems more agreement in the construction with the Turkish than with the Sanscrit. And perhaps the original language of India may be the connecting link between what the Germans have termed the Indo-Germanic family, and the Turkish family of languages.

II. Having considered some of the points of agreement that the spoken languages of India have to one another in their Grammar, and argued from this consideration their common origin, I now proceed to bring forward some specimens of agreement in their vocabularies. Our task here is much more difficult, as the Sanscrit roots have such general meanings often attached to them, that by a little straining almost any thing can be deduced from them. It is probable also that the Sanscrit has adopted many words from the vernacular languages, which did not originally belong to it, and that it has been thus enriched by the spoils of the vanquished; just as the Latin of modern Europe has many words unknown to Cicero and Quintilian. We must however at present go on the supposition that all words found in Sanscrit Dictionaries are Sanscrit, and avoid as much as possible words which might seem derivable from Sanscrit roots, though this last consideration is of less importance, as the roots are not words, but the formations of Grammarians. The blanks in the following catalogue may often be the result of my ignorance, especially in the

Bengálí and Gujaráthí, where I had but limited materials to work on; and indeed when I could connect the Hindí with the Maráthí, and that again with the Canarese, I felt less concern about the intermediate steps, considering that I had established sufficiently the analogy between the languages of the North and South. My authority for the Hindí, is Hunter's Dictionary, Calcutta 1808; for the Maráthí, Molesworth's, Bombay 1831; for the Telugu, Campbell's, Madras 1821; for the Canarese, Reeve's, Madras 1832; for the Tamil, Rottler's, Madras 1834; for the Singhalese, Clough's, Colombo 1830; for the Bengálí, Marshman's English and Bengali Dictionary, Serampore 1828; for the Gujaráthí, a small vocabulary printed at Bombay, and oral information. Except in this last instance, where I had no other alternative, I have never inserted meanings on my own authority and have generally given the very words of the explanations I found in the abovementioned Dictionaries, respectively, even when evidently synonymous, rather than run the risk of corrupting by endeavouring to harmonize them. I have sometimes been obliged a little to abridge them for want of space, and this is all the liberty I have taken. I have confined myself to forty primitive words, all expressive of such ideas as men must use in the infancy of society, or in the first stages of civilization, and which retain their places in a language from daily use, more firmly than any others. On these however many others depend. Thus for example I found by enumeration that No. 10 has given, as depending on it in the Hindí Dictionary, 12 words, in the Maráthí 40, and in the Támil 30, after separating carefully all words agreeing in sound, but not in meaning. Should each of the 40 words, in the following Table then have as is probable, on an average other 5 dependent on it, this will make the comparison extend to 200 words. A few of the most important of these derivatives as in No. 10, are occasionally exhibited, especially when they are useful for showing the connection between the different languages; but to have inserted them all, would have swelled this paper to too great a length, and to my mind at least would not have placed the connection between the different languages in so forcible a light, as by a few primitives brought together, as is here done, connected in one table. In order to simplify the subject as much as possible, I have used only the Devanágarí, and Roman Alphabets; I may therefore, after all the attention I have paid to ensure accuracy, have made some lesser mistakes in converting the words of the languages of Southern India, and writing them in characters differing from those

in which they are usually written, especially in the Tamil. I feel confident, however, that these errors will be found of a nature not at all affecting the general resemblance of the words in which they may occur, to those with which they are compared. In conclusion I wish it particularly to be borne in mind that this paper claims no higher character than that of an Essay. Fully to discuss the subject would require a volume, and much more time than I can at present spare; new words and new analogies, as the subject is prosecuted, constantly presenting themselves, all leading to the same general conclusion.

LIST OF

	Northern Family.				Southern Family.	
	Hindi.	Bangali.	Gujurathi.	Marathi.	Telugu.	Carnatica.
1	आपा. ápá. an elder sister.			आपा, आबा, ápá ábá. sir, sire.	अप्प. appa. a father; an elder sister.	अप्प. appa. a father.
2	बाप; बाबू báp; bábú father; sir, sire.	बाप; बाबा báp; bábá. father; sire.	बाप; बा báp; bá father; sire.	बाप; बाबा, बापू. báp; bábá, bápú. father; sir, sire.	बाबु. bábú, father,	बाबा; बाबू. bábá, bábú, father.
3	काका; काकी. káká; kákí pat: uncle; aunt.	खूडा. khuḍá; father's younger brother.	काका; काकी. káká; kákí pat: uncle; aunt.	काका; काकी. káká; kákí pat: uncle; aunt.	कक्क. kakka. father.	कक्क. kakka. an uncle, a father's younger brother.
4	एडी. eḍí. the heel.	एडी. eḍí. the heel.	एडी. eḍí. the heel.	एड. eḍ. spurring with the heel.	अडमु; एडलु. aḍgu; eḍalu, a foot; to go.	अडी. aḍi. the foot.
5	पेट; पोटा. pet; poṭá; the belly, the womb; the stomach.	पेट. pet. the belly; the womb.	पेट. pet. the belly.	पोट. pot. the belly; the womb; the stomach.	पोट्ट. potta; the belly.	पोट्टे, पोडे. potte, poḍe; the belly.
6	कुनबी. kunbí, an agriculturist.		कूणबी. kúnabí. a husbandman, the caste of cultivators of the soil.	कुणबी; कुळंबी. kúnbí, kulambí. a husbandman. कुळव. kulava. a harrow.	कोमटी. komṭí. a branch of the 3rd. caste. कुल्लगिंचु. kullaginchu. to dig slightly.	कुळ. kuḷa. a farmer. कूल्लगिसु. kullagisu. to loosen the soil.

WORDS.

Southern Family.		Remarks.
Tamil.	Singhalese.	
		I. Terms Marking Relationship.
अपन्; अपा-न्. apan; apám. father; sire.	अप्पा. appá. a father.	No. 1. The Telugu and Maráthí give us the Aramean *Abba* unchanged. *Ab* and *Obo* are used among the Siberian Tartars: See Klaproth's, As. Pol. The Coles S.W. Bengal use *apai*; the Himalayan Lepchas *abo*; the Murmis *aba*, and the Simbas *amba*, the word used by the Todas on the Nilgherry hills for mother is aph.
पापान्. pápán. holy father.	बप. bapa. holy father.	No. 2. The Turkish *Baba* is found in Bengali, Mar. Car. unchanged. The Greek *παπας*, Italian *papa*, are evidently the same as the Tamil *Pápán*, though this last seems confounded in the Dictionary with *Párápán*, the Tamil corruption of Brahman. The Sanscrit अम्बा *Amba* comes so near the Himalayan *amu*, *ami*, *amo*, and the Marathí and Tamil *ayi*, the word for mother, that it is unsuited to our purpose.
	कुडप्पा. kuḍappá. Pat. uncle.	
अडि. aḍi. the foot.	अडि. aḍi. the feet.	No. 3. *Kaka* and *kaki* are used by the Coles; and in a little different sense, the former in Persian. The Singhalese and Bengali are similar but peculiar.
		II. Parts of the Human body.
पेर्रु. perru. bear a child. पेट्टपिलै. peṭṭa pilai. own child.	फड्ड; बड. phaḍḍh; baḍ. the belly; the womb.	No. 5. Compare here the Persian پت put, the liver, and the Arabic بطن the belly. The connection with the San. पेट peṭa, a large basket, is too remote to suppose this word derived from it. The Hindi *petkabeta*, and Tamil *petta-pillai* for *own child* are very analogous.
		III. Trades and Professions.
कुळम्बु. kulambu. clay, loam. कोळु. kolu; a plough-share.	कुम्बर, कोम्बरु. kumbar, kombaru. a paddy field.	No 6. In the Persian we have کوی *Kui* or *Koi* a farm, and کویلو *Koilu* a rustic, nearly connected; and more remotely the Sanscrit कु *Ku*, the earth, कुभ *Kumbha*, an earthern pot, and कुम्भार a potter.

LIST OF

	Northern Family.				Southern Family.	
	Hindi.	Bangali.	Gujurathi.	Marathi.	Telugu.	Carnatica.
7	कोली. koli; a weaver; [see the first Tamil, and first Mar. meaning.]	कोलहान. kolhán. the hill country of the Koles, S. W. Bengal. A Kole and a robber are there synonymous in the plains.	कोळी. a koli. they are known chiefly as hunters and plunderers on the S. of Gujarath.	कोळी. koli. a spider; a Koli; they are hunters, plunderers, fishermen, and some are agriculturists.	कोल्ल. kolla. plunder.	कोळ्ळु. kolu. plunder. कोल्लि. kolli. the act of killing.
8	ढोर. ḍhor; cattle.		ढोर. ḍhor. cattle; i. e, cows, and buffaloes.	ढोर. ḍhor. cattle, i. e. oxen and buffaloes.	तोर्रलु. torralu. cattle. दोड्डी. dorri. a cow house.	दोड्डि. dorri. a cattle pound.
9	टट्टू. ṭaṭṭú; a poney.	टाटू. ṭáṭú. a poney.	तटू. taṭú. a poney.	तट्टू. taṭṭú. a small breed of horses.	तट्टु, तट्टव. taṭṭu, taṭṭava. a poney.	तट्टु, तटवानि. taṭṭu, taṭaváni. a poney.
10	आडा. áḍá. oblique. आड; áḍ. protection; a skreen. अडना. aḍna. to hinder.	आड. áḍ. oblique. आडाल. áḍal. a skreen.	आडो. áḍo. across. आड. áḍ. intervention. आडइ. áḍae. hindrance.	आडवा. áḍavá. across. आड. áḍ. protection. अडथल. aḍthal. hindrance.	अडमु. aḍamu. transverse. अंड. and protection. अड्डंकि. aḍḍangki. hindrance.	अड्ड. aḍḍa. transverse. अड्ड कट्टु. aḍḍa kaṭṭu. to put a skreen अडगाणिके. aḍgánike. hindrance.
11	उभ. ubh; oppressive heat.			उब. úb. sultriness.	उब्ब. ubba. oppressive heat.	उब्बे. ubbe. oppressive heat.

WORDS.

Southern Family.		Remarks.
Tamil.	Singhalese.	
कोलियण. koliyan. a weaver of the Pariah caste. कोलैरूर. kolairur. huntsmen.	कोल्लय. kollaya. plunder.	No. 7. The Kolí or Kole seems to be a branch of the aboriginal family, subsisting in various parts of the country. In the hilly regions in the interior they are known as huntsmen and plunderers; on the sea-coast as fishermen; in the plains on the Ganges and near Cape Comorin as weavers, and in the Deccan, on the Mahadeva hills, they have settled down to cultivate the soil. This word must not be confounded, as is sometimes done, with قلی *Cooley*, a porter.
तोरवु. torravu. a herd of cows. तोट्टि. toṭṭi. a pound.	तवलम्. tavalam. a flock, a herd.	IV. Domestic Animals. Nos. 8. and 9. If any animals can be said to be indigenous to India, the breed of cows with the hump between its shoulders, and the small breed of horses called Tattoo, certainly belong to the number, as they are to be found abundantly, and quite naturalized in every part of the country.
तटु. taṭu. a country poney.		
अटम्. aṭam, across. अडकम्. aḍkam. enclosing. hiding. अडम्. 'aḍam. hindrance.	अडय. aḍaya. a prop. अडस्सिय. aḍassiya. obstruction,	V. Natural States and Substances. No. 10. This root आड ád in the sense of across is evidently the original word from which the others are derived. The Sanscrit अट in the sense of overcome and अट going about, &c. seem quite different words, and enter into the Indian languages in the derivatives अट्ट an upper room &c. There is also an Indian अट *At*, the same apparently as अड *Ad*. Compare also the Arab. اذ and English aid.
		No. 11. The Sanscrit word उष्ण *ushna* variously corrupted, but never losing the ष्ण, or changing it only to न्, is found in most of the languages, and in a different shade of meaning from this word, which seems derived from a different root.

LIST OF

	Northern Family.				Southern Family.	
	Hindi.	Bangali.	Gujurathi.	Marathi.	Telugu.	Carnatica.
12	थंड. thanḍ. cold, calm.	ठान्ता. ṭhántá. cold, cool.	थंड ताहाड. thánḍ, táháḍ. cold, calm.	थंड. thand. cold, calm.	तण. tana. cool.	तण्ण. tanna cold, calm.
13	कचपच. kachpach. crowded together.		कचवच. kachvach. crowded state.	कच. kach. crowdedness. गचाड. gachád. a thicket.	गच्चु पिच्चगु. gachchu pichchagu. to be thrown into confusion.	कच्चपचि. kachchapachi. confusion; jellied-state.
14	कोरा. korá. raw, new.	कांरा. kárá. raw.	कोरो. koro. raw, unbleached.	कोरा. korá. raw, unbleached.	कोरा. korá. unbleached.	कोर. kora. defective.
15	रेल. rel. a flood, a string of animals.		रेल. rel. a flood.	रेल. rel. exuberance.	अल. al. a wave.	अल. al. a wave.
16	कंकर. kangkar. a nodule of limestone.	कंकर. kangkar. gravel.	कांकरा. kángkará. gravel.	कंकर कांकर. kangkar, kángkar. gravel.	कंकर. kangkara. gravel.	कंकरे. kangkare. gravel; hard sand.
17	उत्तु. uttu. plaits of cloth.			ओटी. oṭi. the robe gathered up to form a lap.	ओडि. oḍi. the lap.	ओट्टु. ottu. to cast things into a corner.
18	ओप. op. polish; beauty.		ओप. polish.	ओप. polish.	ओप्पु. oppu. elegance; beauty.	ओप्प. oppa. well polished.
19	काठी. káṭhí; a saddle.		कंठाल. kanṭhál. a pack saddle.	कंठाळ. kanṭhál. a pack saddle.	कंठालमु. kanṭhalmu. a pack saddle.	कंट्टि. kanṭṭi. a pack saddle.

WORDS.

Southern Family.		Remarks.
Tamil.	Singhalese.	
तण्. tan. cool.		
कसंगल. kasangal. the state of being squeezed.		No. 13. The Tamulians confound the *ch* and *s*, so that the Sanscrit चण्ड and सण्ड are corrupted into the same word. Our Tamil word then is equivalent to *Kachangal*.
कुरै. kurrai. defect.	कोरदस. koradus. unripe grain.	
अलै. alai. a wave.	रल. ral. a wave; a flock.	No. 15. This word in Maráthí means an overflowing abundance; and when on the Bali Pratipada, the Kunbis pray to have Bali's Kingdom restored, and all its accompanying blessings, the word by which they express these is रेल.
कंकम्. kangkam. crude arsenic.		No. 16. कंकर in Sanscrit means buttermilk mixed with water, and for the Hindi कंकर the Sanscrit is कर्कर. The conversion of Reph into a nasal is, I believe, unprecedented, and therefore the word, though near, is still different, from the Sanscrit, especially as the nasal keeps its place in all the languages.
ओडुकिडम्. odukidam. a recess.	ओडोक्कुव. odokkuva. a place in the waist for money, &c.	
ओपु. opu. smoothness, beauty.	ओप. opa. glittering, v. polish.	No. 18. This seems a genuine aboriginal Indian word, probably connected with the Persian آب and Sanscrit आप, the former word meaning both water and beauty; but the latter not used figuratively. The Singhalese to form the verb requires the anxiliary *to do*.
कंडालम्. kandálam. a pack saddle.		

LIST OF

	Northern Family.				Southern Family.	
	Hindi.	Bangali.	Gujurathi.	Marathi.	Telugu.	Carnatica.
20	कावर. kávar; the baskets in which Ganges water is carried about.		कावड. kavar. a lathe for carrying burdens. &c.	कावड. kávár. a lathe with slings attached at either end for carrying baskets, &c.	कावडि. kávari. a piece of wood made for being placed on the shoulder to carry burdens with ropes at each end	कावडि. kavari. a split bambu with ropes attached at the ends for carrying burdens.
21	कुर्नी. kúrní. a scoop. कोडना. koḍna; to scoop.	कुर्नी. kurní a scoop.	कोयरू. koyaru. to scoop.	कोरणे. koraṅé. to scoop.	कोरकु. korraku. to gnaw; to grind.	कोरवु. korabu. to scoop out.
22	छाप. chháp; a stamp.	छाप. chháp. a stamp.	छापो. chhápo. a stamp.	छापा. chhápá. a stamp.	चप्पा. chappá. an impression.	चाप. cháp. a stamp. चापि. chápi. a floor mat
23	झोपडी. jhopaḍí; a hut.	झुपडी. jhupaḍi. a hut.	झोंपडी. jhopaḍí. a hut.	झोपडी. jhopoḍi. a hut.		जोपडी. jopaḍi. a tent; a hut.
24	टट्टी. tatti; a skreen; a matted shutter.		टट्टी. tatti. a blind made of split bambus, &c.	तट्या. tatya. a bambu mat.	तडक. taḍaka. a tatty; a straw blind.	तटिकि. taṭiki. a tatty or blind.
25	पोट. poṭ; a bale.			पोतें. pote. a sack.	पोट्टमु. poṭṭamu. a small paper bag.	पोट्टण. poaṭṭan. a paper bag.

WORDS.

Southern Family.		Remarks.
Tamil.	Singhalese.	
का, कावडि. ká, kávari. a piece of wood with ropes attached, &c.	कवंदन. kavandan. a bullocks yoke.	VI. Artificial Productions. No. 20. Something like the Kavar is used in England by the milkmaids. It is an exceedingly common contrivance for carrying light loads in India.
कोर्रु. korrabu. nibbling, as a mouse.	कुरुटु. kurutu. a rasp.	21. The 2nd Pers. Sing. Impt. of the Singhalese verb is used the better to shew the analogy. From the Sanscrit क्षुर to cut, comes क्षुरी, corrupted in Hindi to छुरी, so that *it is not likely* that this word is derived from that root.
चापै. chápai. a straw mat.		No. 22. The Sanscrit चप means among other things to reduce to powder, a meaning never applicable in the vernacular tongues. If the Sanscrit is not misinterpreted, our word must be different. It is possible however that the sense given is borrowed by the author of the Dhátu Manjari from a hasty induction of *words* in the vernacular tongues, and that he should have given the idea of stamp, impression, &c.
तटि. tati. a skreen.	तटिटु. tatitu. a ceiling, a ship's deck.	
पोदि. podi. full sacks or bags.	पोदिय. podiya. a bale.	

LIST OF

	Northern Family.				Southern Family.	
	Hindi.	Bangali.	Gujurathi.	Marathi.	Telugu.	Carnatica.
26	मोटरा. motra. a bundle.			मुडा. muḍa. a package. मोट्या. motyá. a porter.	मुड्डवु. muḍḍavu. a bundle of money, &c.	माट्टे. motte. a burden; a bundle.
27	थेवा. theva. a stone set in a ring.		ठेव. ṭheva. a deposit.	ठेवणे. ṭhevané. to place.		
28	कनवंडा. kanvanḍa. diffident.			कनवाळू. kanváḷu. sympathizing.	कनिकरमु. kanikarmu. sympathizing.	कनिकर. kanikar. pity.
29	मोटा. moṭá. fat.	मोटा. moṭá. fat.	मोटो. moṭo. large.	मोठा. moṭa. large, great.	मुदुरू. muduru. full growth.	माट. máṭa. handsome
30	अटकल. Aṭkal. conjecture.	अटकल. aṭkal. conjecture.	अटकल. aṭkal. conjecture.	अटकळ. aṭkaḷ. conjecture.	अट. aṭa. it is reported.	अडसटु. aḍsaṭu. conjecture.
31	उभरना. ubharná. to overflow.		उभरावू. ubharávú. to overflow.	उबरणे. ubaraṇé. to emit pus copiously.	उबुकु. ubuku. to overflow.	उबुकु. ubuku. to overflow.
32	उलटाना. ulaṭáná. to overturn.	उलटा. ulaṭá. turned over.	उलटा. ulaṭá. turned over.	उलटणे. ulaṭaṇe. to turn over. उलट. ulaṭ. turned back as a wheel.	उरलु. uralu. to roll.	उरुलु. urulu. to roll, to turn round.
33	कच कच. kach kach. altercation.		कचकच. kach kach. altercation.	कचकच, कट कट. kach kach, kaṭkaṭ. wrangling.	कच्चे. kachche. a dispute.	कटकटेयु. kaṭkaṭeyu. teazing.

WORDS.

Southern Family.		Remarks.
Tamil.	Singhalese.	
मुडिचु. mudichu. a bundle.		
तवट्टल. tavaṭṭal. a concealing, a staying.		
कण्णराळि. kaṇṇarāḷi. a melancholy event.	कनकल. kanakal. excellent.	VII. Qualities. No. 28. The root here is the Telugu कनु as a noun meaning the *eye*, and as a verb *to see* to *regard*. Thence these adjectives seem to be derived. The Sanscrit कण means the facet of a gem; and कनिका the pupil of the eye is more probably adopted from this than itself the root. At any rate no adjective, similar to those in the vernacular language derived from any of these words, exists in Sanscrit.
मोत्तमुट. mottamuṭa. the total.	मोनवट. monvaṭ. beautiful.	
		VIII. Acts. No. 30. The Telugu అట is here again clearly the root of these words. No. 31. Compare here the Latin *Uber*.
उबुकल. ubukal. overflowing.		
उरूळ. uruḷa. a wheel.		No. 32. The English *Whorl*, Sanscrit, वलय a bracelet, and वर्तुल a circle, may all have a distant connection with these words.
कटाकम्. kaṭákam. disputation.		

LIST OF

	Northern Family.				Southern Family.	
	Hindi.	Bangali.	Gujurathi.	Marathi.	Telugu.	Carnatica.
34	कर कर. kar kar; immoderate laughter. कडाका. karaka; a crash.	कडकड. karkar. a *rattling* noise.	करकड. karkar. a crash.	कडकड. karkar. sound of drums, &c. कडाकड. karákar a crash.	कडायमु. karáymu. violence.	कडकु. karaku exertion joy.
35	गुडगुडना. guḍguḍná. to rumble. गुडगुडी guḍguḍí. a small hookah.		गगडवु. gagaḍavú. to rumble.	गुडगुडणे. guḍguḍne. to rumble. गुडगुडी. guḍguḍí. a hubble bubble.	गुटगुट. guṭ guṭ. the noise of boiling water.	गुडगुडि. guḍguḍi. the noise made by a hookah.
36	जोडना. joḍna. to join. जोडा. joḍa. a pair; a pair of shoes.	जोडा. joḍa. a pair.	जोडो. joḍo. a pair.	जोडणे. joḍne. to join. जोडा. joḍá. a pair; a pair of shoes.	जोडु. joḍu. a pair; a pair of shoes.	जोडिसु. joḍisu. to unite. जोडु. joḍu. a pair; a pair of shoes.
37	ठेक. ṭhek. support.		ठेकवु. ṭhekavu. to support.	टेकणे. ṭekane. to place on a support.	टेकमु. ṭekamu. a banner.	टेके. ṭeke. a banner; an embrace.
38	फिरना. phiraná. to turn; to return.		फरवु. pharavú, turn round.	फिरणे. phirane. to turn; to turn away.	पिरि. piri. to separate one's self from another.	पिरि. piri. to separate one's self from another.
39	बोलना. bolana. to speak.	बल. bal. speak.	बोलवु. bolavú. to speak.	बोलणे. bolane. to speak.	बोल्लु? bollu. to boast.	बोलविसु? bolavisu. to bless.

WORDS.

Southern Family.		Remarks.
Tamil.	Singhalese.	
கடகடப்பு. kargarapu. a rattling sound like thunder.	කරදර. kardar. teazing.	Nos. 33, 34, 35. The reduplicated form of these words is characteristic, and shews the close relation they have to one another; otherwise the two first might be easily enough traced to Sanscrit roots, and their belonging to the primitive Indian tongue not so evident.
குடுகுடி. kudukudi. a hookah.		
சோடு. chodu. a pair; a pair of shoes.		No. 36. I do not know any instance of the conversion of ग to ड; so that this cannot come from the Sanscrit योग, which besides is a common word in many of the languages. Another singularity is the use of the term meaning *a pair*, as a specific word to denote a pair of shoes, but not any other specific pair.
தேக்கல. tekal. a being stayed.		
பின்ரு. pinru. retreat.	පෙරළ. peral. overturn.	38. This resembles in form the Sanscrit preposition परी, and the Greek περι. It agrees better in meaning with प्रति, though its being used as a verb, and inserting the ළ after the first consonant are characteristic. In the northern tongues both परि and प्रति are extensively used by the educated, but never confounded with this verb.
பொலிப. polip. a brief explanation.	බොල. bola. a familiar term of address.	

LIST OF

	Northern Family.				Southern Family.	
	Hindi.	Bangali.	Gujurathi.	Marathi.	Telugu.	Carnatica.
40	मोडना. modana. to bend.	मोडा. moda. bend.		माडणे. modane. to break; to bend.		मुरि. muri. to break to pieces.
41	अबे. abe. Interjection of scorn.			अबब. abab. Interjec. of surprise.	अब्बब्ब. abbabba. Inter. of wonder.	अबा. aba. Inter. of wonder and grief.

WORDS.

Southern Family.		Remarks.
Tamil.	Singhalese.	
मुरि. murí. to break.	मडनवा. maḍanvá. to squeeze.	
अपा. apá. Inter. of grief.	अपोयि. apoyi. alas! oh!	No. 41. I have added this interjection as running in somewhat different senses through the languages.

IV.—We have great pleasure in re-publishing the following Circular of the Royal Society of Northern Antiquaries, for which we are indebted to a distinguished member of that body now prosecuting researches in this Presidency.

"THE ROYAL SOCIETY OF NORTHERN ANTIQUARIES, founded with a view to increase and diffuse the knowledge relative to the Antiquities of Northern Europe, has endeavoured to attain its object by the publication not only of the most important ancient MSS. of Northern literature, together with translations of, and commentaries on them, but also of works illustrative of other objects of archæology. Of late years, however, the Society has turned its attention to those countries, of which the early history may be said to be of great importance to northern Europe, as well as likely to receive light from it in return. The Society, therefore, has endeavoured to enter into a correspondence with learned men and scientific bodies in those countries, in the hope that the scientific advantages resulting from a steady and mutual co-operation will be found to be reciprocally beneficial.

The Society has already experienced that such a mutual co-operation tends to the happiest results,—and is therefore desirous to effect such an intercourse with Societies and learned men in Asia. For this purpose the Society has appointed a Committee, the object of which is to endeavour to throw light upon the relations which have existed of old between the North of Europe and Asia.

The inhabitants of the North of Europe belong to the stock of nations, which spread itself from the banks of the Ganges to the Atlantic Ocean. It is but natural, therefore, that there should be corresponding points between the various languages, which have had one source in common. Much has been done of late years towards finding out and proving such relation or coincidence; from these researches, however, the *Old Northern Tongue* has been excluded, although it is the only ancient Gothic language which we possess entire, and which in fact may still be called a living tongue; and although both in a grammatical and lexicographical point of view, it exhibits so many discrepancies from the other Gothic languages, and so many points of resemblance with the *old languages of India and Persia*, that it is well worthy of a place in our disquisitions on comparative philology.

The Old Northern tongue is preserved in its purity in the ancient poetry of the *Eddas*, in which is also preserved the Old Northern mythology, which has long been supposed and partly ascertained to have much in common with that of India and Persia, and wherein *Buddhism* also seems to have left its traces. At all events, these are subjects which lay claim to our serious attention, and to such a careful and close examination as will lead to a definite result.

But the Committee intends also to turn its attention to the practical life of these nations, whether public or private. It is not only the ancient forms of *Government, Worship, Ceremonies* and *Rites* or *Architecture*, which should be considered;—but also *Domestic life, Arms, Utensils*, whether of stone, bronze, copper or iron; *Ornaments*, not only those of metal, but such as were made of amber, glass, etc. On all such matters a clear light will be thrown by a comparison with Asiatic antiquities.

From a remote antiquity commercial relations existed between Asia and the North of Europe. Abundance of *Cufic coins* and other matters are frequently discovered in excavations, which would seem to lead to the inference, that such commercial intercourse exerted no unimportant influence on the North, and likewise on the countries from whence the intercourse originated.

Such is the outline of the plan this Committee intends to follow in order to attain the object it has in view. But this it cannot effect alone and unaided. It wishes therefore to invite scientific societies and learned men in Asia to enter into correspondence with it, and to co-operate towards the attainment of an object, which is of the greatest importance to the common interests of science. Such a connexion may take place by a reciprocal interchanging of Dissertations inserted in the Transactions of the learned Societies in both countries; but chiefly by zealous researches on both sides, and by communication of all important facts—as well as by a mutual exchange of antiquities and writings of like import. Such a connexion, moreover, would afford other advantages to the learned of Asia and Europe, and would greatly facilitate the circulation of the various works of science which from time to time are published."

V.—*Ehrenberg on the Coral Islands and Banks of the Red Sea.*

(Continued from page 72.)

Of the general nature and formation of Coral Banks as hitherto known.

It appears that Mr. Strachan, an Englishman whose name is not much known, had discovered in the year 1702 * in Ceylon, that the coral-animals were able, by mere activity, to form large masses of rock. "There is a great quantity of a kind of white coral upon the shore be-"twixt Galle and Matura—the Hollanders building houses and walls of "it. There are great banks of the said coral, and betwixt and upon these "grow others until it is become like a rock for thickness. These branches "are not softer when they are young than when they are ripe, yet "I have always observed a slime upon them when they are "under water, which I suppose is the substance which petrifies." Before him, Linschoten merely observed in the Mosambique Channel, 1599, that the corals appeared as masses of rock, and from the simple account he gives, it would appear that the term coral-rocks had been generally applied by seamen to the rocks of the South Sea, as early as the middle of the 16th Century; but I have not found proofs for it elsewhere. It is true don Juan de Castro mentions, 1540, two sorts of corals in the Red-Sea, but he did not think them identical with the banks which he calls rock. † In the year 1780 the ingenious and celebrated John Reinhold Forster of Dirschau near Danzig, who died as Professor in Halle, and who, with his son, had accompanied Cook on his second voyage round the world in 1772, first directed the attention of the public to the influence of the coral animals upon certain islands of the South-Sea. From his own observations he was persuaded that they greatly co-operated in the formation of many isles. He thus expresses his opinion in his "Notes upon a voyage round the World.," p. 20—"All "islands in the various seas which we have crossed, may be properly con-"sidered submarine chains of mountains, whose summits rise above the

* Some observations on Coral made in Ceylon.—Philos. Transactions, vol. XXIII., p. p. 1248, 1702.

† The same author speaks of red and white corals in the Red-Sea, and Flarant von Polschiz 1598, also mentions red corals there, as Pliny had done before him. I have exchanged the Sicilian red corals in Massava for their weight in gold,—a sufficient proof that they are not now, to be found there. What may those red corals have been? According to Polschiz, p. 658, they were as thick as an arm; hollow and porous; consequently they must have been tuff corals, and not red corals. I have brought with me from thence a few specimens of the black coral celebrated from ancient times; they are of the Antipathes Isidis Ploeamos, a form hitherto not scientifically known.

The red Coral of the Red Sea is undoubtedly the Tubipora Musicalis (T. Ruberrima of Ellis) which abounds on its shores; at Tejoura, and at Aden, from which there are specimens in the Museum, collected by Captain Young I. N. The solid red Coral of commerce (Corallium Rubrum) is a production of the Mediterranean. It is imported into Bombay, but in small quantity.—*Editor.*

water:" and in the part which is superscribed "System of the formation of Islands," page 126, he divides islands into 3 classes, viz. 1, Sand hills; 2, mountainous islands with coral banks; 3, mountainous islands without coral banks. According to him, all islands of the 2nd and 3rd classes show, with scarcely a single exception, plain vestiges of a former violent change of their surface by fire, or rather by Volcanoes; but all flat islands which belong to the first class, grow in the Sea, or rather are the works of polypes, being raised by lithophytes from the bottom of the sea, and gradually spreading as they approach its surface. He thinks the banks built by coral animals always encircle a sea with abundance of fish, but their circles have frequently many openings. The bank, he imagines, is built by the worms perpendicular like a wall, until a little beneath the surface of the water. The waves drive sand, shells, sea-weed, and fragments of corals upon it, which raise the wall, until at last it rises above the water. The sea continues to accumulate firm particles upon it, and the waves and birds carry thither the seed of plants which grow on the shore: some of these, when they die produce mould, and if a cocoanut—which long retains the power of sprouting—should be driven upon it, it will become a tree, from which splendid forests of cocoanut-trees will afterwards spring. Forster adds—"The worms which build the bank appear to "secure their dwelling by instinct from the fury of the wind and the foaming sea: they build their coral banks in the tropics, where the wind "almost always blows from the same quarter; and so raise their habi-"tations, that they form a sort of a circular wall, separating a part of the "sea where the breakers are not so high as in the rest of the ocean." However, this latter remark betrays an imperfect knowledge of coral animals.

Forster's observations of the formation of islands in the South-Sea, are ingenious and original, but not always correct. In the year 1814 they were again brought into notice by Captain Flinders, who was of the same opinion as Forster—being led to it by observing a small island in the Torres Straits between New Holland and New Guinea called by him Half-way-island. He himself saw that the islands there were lying near each other in different gradations of formation and perfection. Some of them were finished, but still uninhabited; others rising above the surface of the water, but as yet void of vegetation: and there were others again which were covered with water by every flood-tide. He writes as follows:—"It appears to me that when the animalculæ "which form the corals in the depth of the sea cease to exist, their

" buildings stick together, either by something adhesive in themselves " or by some peculiarity of the sea water. When the interstices " are filled up with sand and fragments of corals, which are also ad- " hesive, a rocky mass is produced. Future generations of these animals " build upon this rising bank, and when they die, contribute to its spread " and growth. The surprising instinct of these inconsiderable animals " is exhibited in the care which they take to make the first gradations " of their building perpendicular. When their rocky wall, especially in " places where the winds continually blow, has reached the surface, it " forms a parapet, near which, protected against the wind, they can " rear their young without interruption."—With the same instinctive foresight, they build the side of the coral bank which is exposed to the wind from the open sea, generally, if not always, very high and nearly perpendicular, so that it sometimes rises from the depth of 200, and perhaps more, fathoms. It appears necessary to the existence of these animals to be constantly covered with water, for they build only in the crevices of the rocks which are filled with water at low ebb: but coral, sand and other fragments washed upon it by the waves, stick to it, and thus form a strong mass as high as the flood-tide. Fragments above this height, which are scarcely covered with water, lose their cementing property and remain scattered—thus forming a hillock upon the top of the rocks. The newly finished bank is soon visited by birds; marine plants take root upon it, and mould is formed: a cocoanut or pandanus fruit is cast upon its shore; land birds resort thither and carry to it the seeds of plants and trees. Every high flood-tide, and still more every gust of wind makes an addition to it; it gradually becomes an island, and last of all, man comes and take possession of it. Peron stated his opinion far more exactly than Captain Flinders; it fully agrees with both the above mentioned, and had been formed from observations made on the occasion of Captain Baudin's expedition at the same time with that of Captain Flinders; but his lively imagination ascribed to coral animals such a share of influence upon the formation of the surface of the earth in the tropics, that he mentions 245 islands and portions of land which he supposes to be wholly or in part the productions of coral animals, and which he fancies these microscopical creatures have built from the bottom of the sea and formed into extensive table lands. Peron examined the island of Timor more particularly; which, with its mountains, he ascribes solely to the work of coral animals, and compared to which, the most stupendous

buildings of men are only inconsiderable and paltry. Peron believed, at that time, that all volcanic elevations of rock and land must have great irregularities in their surface, and as he did not find this in the coral islands visited by him, he clung firmly to the opinion, that the sea must formerly have covered them; but left it to others to explain how this could be possible—contenting himself with stating what he considered the fact.—Peron's Voyage, vol. II., p. p. 165 to 192.

After Peron, Adalbert de Chamisso was most assiduously engaged in the examination of coral banks during his voyage round the world with Captain Kotzebue, in the years 1815 to 1818, and to him we owe the first fully detailed description of the coral banks of the South Sea, and a more systematic description of their formation. With the cold penetrating eye of a naturalist, separating that which was probable from that which was possible, De Chamisso observed in a very particular and ingenious manner the island Radak, and described it in a warm lively manner: he gave in one view a much more perfect and vivid description of the general formation of such islands than either Forster or Flinders. What De Chamisso has described in detail, p. 30 and p. 106 of his "*Notices of a Voyage,*" we find at page 187 comprised in one picture, which indeed is not dissimilar to that drawn first by Forster, and after him by Flinders, but which contains much originality in a natural manly manner; it is all from his own experience, and nothing borrowed for the sake of ornament. The following is a sketch of this picture. "The fact that coral islands appear in rows, and that there are many in some, and few in other places, in the same sea, leads to the conclusion that coral animals have erected their buildings upon shallow places or on the summits of submarine mountains, which they increase in height and breadth. The larger kind of coral animals appear to prefer the more agitated parts of the sea; this circumstance causes shells and fragments of corals to be thrown over the wall raised by them, and thus prevents them from building in the middle; this accounts for the circumstance of the exposed side first reaching the surface. At low water these banks gradually become dry near the surface. The coral animals then cease to build, but the waves wash shells, fragments of corals and sea urchins between the rows of coral, and thus by the cementing sand produced by friction being acted upon by the sun, forms one solid mass as hard as a rock. This gradually increases by the same means, and grows in size until it at last be-

comes so high, that it is only covered by high flood-tides. In the dry season the sun heats the mass of rock to such a degree, that it splits in many places and comes off in layers. The waves pile these flat stones upon each other; coral rocks and limesand are thrown upon them in a similar manner. The limesand forms, and offers to the seed of trees and plants growing on shores, a fertile soil, so that its white ground is soon overshadowed with trees; this is sometimes accelerated by the arrival of full grown trees, which have been washed by torrents from their native soil, and find here a resting place after long wanderings. With these arrive small animals, such as lizards and insects, to be the first inhabitants. Before the trees unite themselves into a forest, seabirds make their nests upon them, stray land birds take refuge in the bushes, and when all is completed, man comes, takes possession of the fertile soil produced by withered and rotten leaves, and calls himself lord and proprietor of a new world." Besides this, Chamisso gives a full description of the circular formation of coral rocks.

An excellent essay on the same subject was written in the year 1823, by Messrs. Quoy and Gaimard, upon a voyage of discovery with Captain Freycinet; it was read in the Acadamie des Sciences at Paris in 1824, and is printed in Annales des Sciences Naturelles 1825. The opinion of both these learned men is, that the influence of coral animals upon the formation of islands in the South Sea has been exaggerated, and that the phenomena which have been given as proofs, are often erroneous, in consequence of their having been superficially examined. This remark is the more important, as it agrees with what is maintained by Leopold von Birch in his description of the Canary islands, 1825; in which he criticises and compares, in a most accurate and scientific manner, the geological accounts of all travellers in the South Sea.

Peron was very sharply reproved by his countrymen for being bigotted to his own opinion, to prove which he injured the truth by making quotations and appealing to authorities, which were founded upon superficial observations. Quoy and Gaimard do not think that the Society Islands, New Ireland, the Lousiade and others, are built wholly or in part by coral animals, but that all of them have a different rock for their foundation, similar to that of other known islands and continents: slate, sandstone, limestone, and even granite, are found upon the various islands of the South Sea. Slate is found even in Timor, from which they imagine that many of the South sea islands have been produced by volcanoes.

The above mentioned writers describe the manner in which Lithophytes build their dwellings upon foundations already existing, of a different nature from their own; and they also point out what circumstances contribute to their growth and elevation, and what do not.

Further, they endeavour to prove that there exists not one island of any consideration constantly inhabited by man, which is entirely built by coral-animals; and that these little creatures do not build perpendicular walls from the bottom of the sea, but only form layers and crusts of a few fathoms in thickness.

They say that the polypes which produce stone, increase where there is constantly high temperature, and where the bottom of the sea is cut up in caves enclosing shallow and quiet water, where they are not disturbed by high waves or the trade winds. They build upon submarine rocks, but do not form them; they merely cover them wholly or in part. All circular coral banks of the South Sea, according to their opinion, depend upon the foundation on which they build. Masses of madrepores, are only met with in sloping and shallow cliffs; whilst in agitated places, specimens of a globular shape are seen scattered.

Again, it is true, they admit the fact which has been often told by seafaring men, that there are coral-banks in the South Sea, which rise like walls from a depth which cannot be fathomed; but Quoy and Gaimard contest that these perpendicular walls are not wholly formed by corals.

1 Because the beautiful colours of coral animals can only be produced by the influence of light, which does not exist at a great depth.

2. Because at a depth of several fathoms, none of these animals are seen to grow, much less can they exist at a depth 1000 or 1200 feet.

3. Because in this case these animals would be the only creatures that could live in all depths, under every pressure of water, in every temperature.

4. The sea at great depths is always in motion, and breaks with tremendous force against the banks, even if not put in motion by wind; now if coral animals build in places not exposed to strong winds, which is a well proved fact, it is certain that the steep walls in the teeth of winds cannot be erected by them. They rather build in shallow places or where they can find a shelter, and thus contribute to diminish the depth of the sea which already is not great.

5. All those walls which people say have been built by coral ani-

mals, have clefts in them, through which the sea can flow. If those circular perpendicular coral banks were built throughout by coral animals, these openings would not be so deep, for coral animals build in solid masses; and could they build up from the depth, these openings would not be formed, whereas they are found in all these walls without exception.

Their reasons for considering it improbable, that any considerable inhabited island has been built throughout by coral animals, are the following.

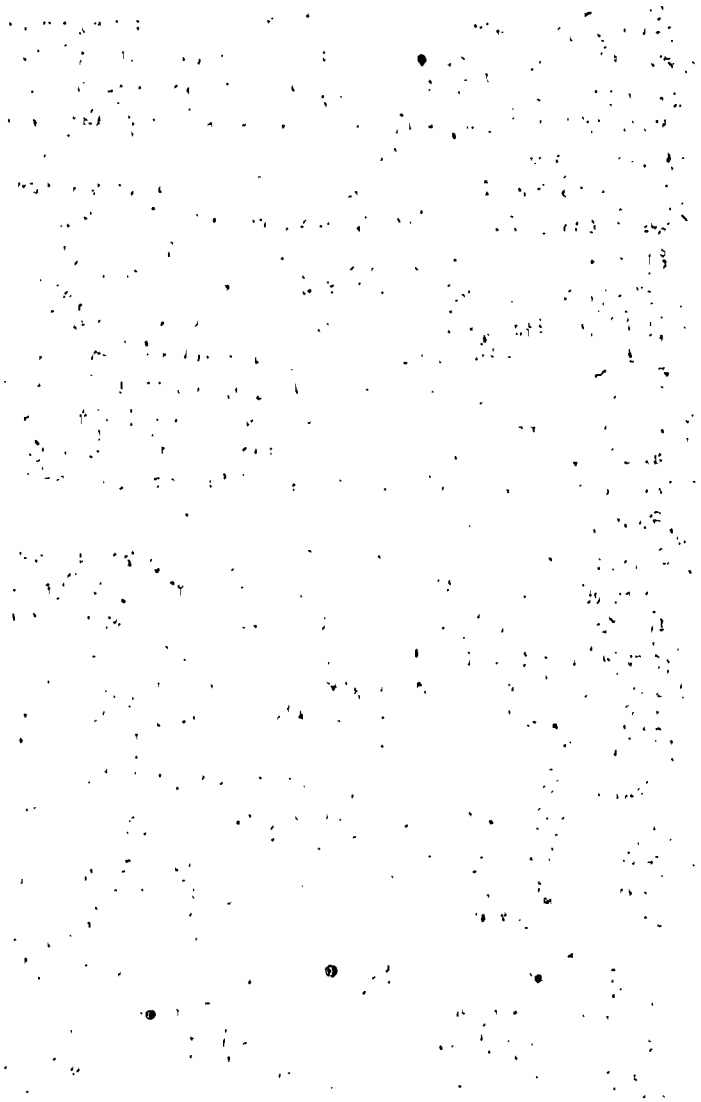
From the examination of the island of Timor, especially near Coupang, no proof whatever can be gathered for its being formed by coral animals as Peron asserts, however interesting and surprising the influence of corals upon it may be; but it appears plainly that slate rock with veins of quartz, in which even gold and copper are found, and masses of volcanic rock, served them as a basis for their building; and calculating the thickness of the crust of coral, we found it to be only from 25 to 30 feet.

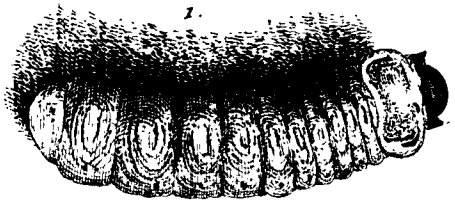
Again, the Astreæ, which alone can cover extensive plains, begin between 25 and 30 feet below the surface of the water, and build up to its surface. Anchors and sounding-leads have never brought up fragments of it from a greater depth. The branchy madrepores, which never form dense and firm strata, live in a greater depth—50 or 80 fathoms; and Retepora as deep as 100 fathoms, which we ascertained ourselves.

John Barrow lately directed the attention of the public to the description by Lieutenant Kendal of one of the Shetland islands, which is of a circular form, inclosing a sea, and still shows volcanic activity; at the same time he hinted at the similitude of the coral islands in the Pacific,* which he mentioned on former occasions, whose volcanic basis is, by the surprsing activity of the small coral animals, transformed into fertile Islands. (Journal of Royal Geographical Society, Vol. I., London 1830-31, page 62). If we compare these various accounts of learned circumnavigators and naturalists, we are immediately struck with their contradictory statements, upon which, however, I do not here enter farther, but proceed to state my own observations.

With regard to the formation of islands and rocks coated with corals,

* I was not able to meet with these words in Mr. Barrow's works. Perhaps he has the honor to be the first who published that volcanoes were the basis upon which coral banks in the South Sea are erected. Perhaps he only expressed this supposition verbally.

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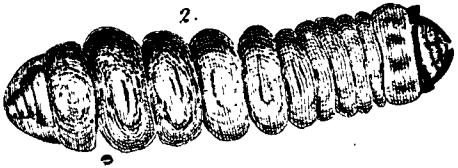
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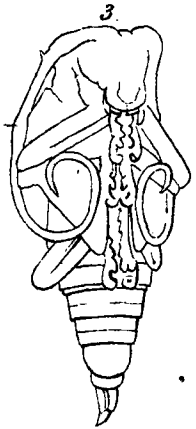
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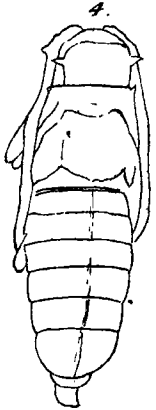
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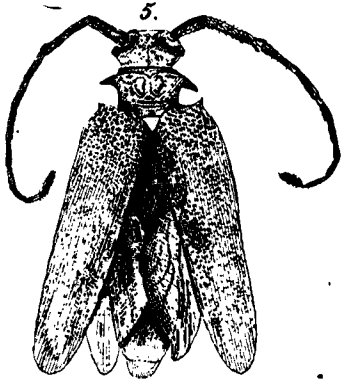
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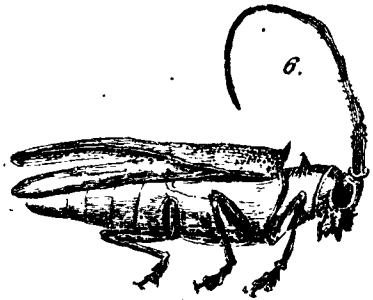
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these naturalists confirm the accounts of their predecessors, one of whom was Forster. For this purpose they examined to their entire satisfaction, the small island of Kera in the bay of Coupang near Timor.

According to an account of De Blainville, in his interesting essay on Zoophytes (Dictionarie des Sciences naturelles, Article Zoophytes, 1830, page 95) Professor Reinhard, who was some time in India, does not believe that Quoy and Gaimard were correct: he rather approves of the representations of Forster and Peron, but gives no particular reasons for it. (*To be continued.*)

VI.—*Note on the destruction of the Adansonia digitata and other trees, by a species of Lamia.*

The rapid destruction of the large Adansonia in Colaba, which has been noticed by many of the residents in Bombay, has been effected by the larvæ of a species of capricorn beetle; a correct representation of which, in its several stages, is given in the accompanying lithograph executed at Madras, from a drawing made by Professor Orlebar. This beautiful tree was apparently vigorous and free from disease in August 1840; and it was not till the end of October that I observed, that one of the principal branches was bored by numerous round holes. In January this branch, which Mr. Buist ascertained to be 13 feet in circumference, fell, and a few days after I examined it, and found the part which had given way penetrated by irregular cavities filled with gnawed wood. These cavities were of considerable length, and varied from $1\frac{1}{2}$ to $\frac{3}{4}$ of an inch in width: most of them were empty, but after cutting away part of the wood, I found several to contain the large grub, figures 1 and 2. These were of various sizes, and corresponded more or less nearly to the part of the cavity in which they were found. The destruction of the substance of the branch was great, and with the extreme softness of the wood and the weight of the top, explained the fall of the branch. The crysalis was found at the same time, and an injured specimen of the perfect insect was given me by a horsekeeper. The perfect insect (figs. 5 and 6) was drawn from a specimen brought to Mr. Orlebar by one of the students at the Elphinstone College, whose curiosity had been excited, and who searched for it several days. They have since been found abundantly on this and other trees in the island. A copy of the drawing was sent to London, and was examined by the Rev. Mr. Hope, President of the Entomological Society, who favored me, through Dr. Royle, with some remarks regarding it, which he also submitted to the Entomological So-

ciety at one of its meetings last winter, (Annals of Natural History, February 1842.) The following is an extract from his letter:—"The "Lamia is Lamia sentis of Linneus, and some have confounded La- "mia rubus with it, which is an error. I lately mentioned, in a paper "to the Entomological Society, that the ravages produced by Lucanus "and Lamia, must cause great destruction in an Indian forest, and re- "gretted that I could not substantiate the facts. Your letter gives "ample evidence of the powers which these minims of creation possess, "and confirms my previous view."

The almost total destruction of this great tree, which is 44 feet in circumference, in little more than a year, is a very remarkable fact, and certainly does afford a strong confirmation of Mr. Hope's views; but the destruction of the tree, which he proposes as a means of checking the evil, does not seem to be requisite, as the trees in the neighbourhood do not appear to be attacked, —disease, if it may be so called, spreading from the part first affected, like an ulcer, one branch falling after another as the decay extends round the trunk. The bark is left untouched, except by a few round holes, caused, I believe, by the full-grown insects eating their way out. Probably trees having hard wood are not liable to be attacked. I extracted many years ago, at Hyderabad, a similar grub from the Horse Raddish tree (Hyperanthera Moringa); and many fine graft Mango trees were destroyed or injured at the same time, in the neighbouring station of Bolarum, by a similar insect. The gardeners endeavoured to get rid of the evil by cutting into the tree and removing the part attacked, but I believe, without much success, as it was not discovered till the round hole made by the perfect insect eating its way out, showed that it had already made some progress. The cocoanut trees in Travancore and Malabar are often destroyed by the young leaves of the head being devoured by a grub, probably of the same family. I have heard that this insect is eaten by the natives.* A distinguished naturalist, Mr. F. D. Bennet, in his Narrative of a Whaling Voyage round the world, mentions, that at the Island of Timor a wooding party from the ship "brought him the *Larvæ* of a "gigantic beetle, which had been found in the trunk of a tree. It was "of that kind usually eaten by the Malays, and which, when preserv- "ed in sugar, is also esteemed a delicacy by the Chinese. Its body

* This custom is not peculiar to the East, if we may judge from the name of a species common in the North of Europe, *Lamia dilis*.

" is soft, of a delicate whiteness, and, in addition to the normal mem-
" bers, has on the back a series of false feet, similar to those that ob-
" tain in the Cerambyx family of beetles."

The name given by Linneus to the insect found in the Adansonia is Cerambyx sentis not Lamia sentis, as mentioned by Mr. Hope,—the genus Lamia having been separated from the great tribe of insects classed by Linneus under the former name. He mentions that the " larvæ of the Cerambyces bore through the inner part of trees, pul-
" verising the wood, and are transformed into perfect insects in the
" cavities thay make."

A similar observation is made by La Marck regarding the whole family, which he has divided into ten genera: "Tous ces insects, sont phytiphages, et dans le plupart les larves ne vivent que de la substance du bois : elles font beaucoup de tort aux arbres, surtout celles des grandes especes." It is remarkable, however, that in the edition of this celebrated work, now in course of publication by Dr. Milne Edwards and M. Deshayes, while the Leptura and other genera are said to live on the substance of trees and the roots of living vegetables, the Lamias are mentioned as being found *on* trees and other plants. It would be interesting to ascertain what species attack particular trees, and whether the same species are found in differeut parts of India. As the Adansonia is most probably not a native of this country, it is not likely that the insect is peculiar to it, and indeed they are found on different trees in the neighbourhood, although the great softness of the wood of the Baobab tree appears to render it the favourite nursery for the young.

It is useless to repeat the old assertion of Adanson regarding the antidiluvian age of this tree, to which Mr. Lyell has given a very absurd notoriety. There are some interesting remarks on this subject in the *Bombay Times* of the 8th June last, where it is stated, on the authority of Dr. Wilson, that the tree was introduced by the Portuguese from the Mozambique within the last three hundred years. This is not improbable, but it would be desirable to have some particulars as to the authority on which it is stated, as it is very likely that a tree so remarkable, and in some respects so useful, and which abounds along the shores of the Red Sea, was introduced at an earlier period. In a note accompanying the fruit of this tree received from Lieut. Blake, 7th Regt. N. I., it is mentioned that it was introduced into Mandoo, the ancient capital of Malwa, amongst the ruins of which it still flourishes, by the Khiljee race of Kings; probably therefore between

A. D. 1404, when Hoshung Shaw, the founder of the dynasty, removed the seat of government to Mandoo, and 1502 when the Kingdom began to be dismembered. It is there called the Khorosani Imlis. In Ceylon and the South of India it is known under the name of the Ethiopian Sour Gourd or Tamarind (Imli), for which last it is used as a substitute, as it was in Egypt many centuries ago.

Large Adansonias are found along the roads of many modern cantonments in India, where they could not have been planted 50 years ago; and the Colaba tree, although hastening to decay, has increased so rapidly during the last 18 months, as to have pushed down a wall, beyond the inner line of which it now projects considerably.

The concentric layers of this tree are very remarkable, but have no connection with the annual rings of the trees of temperate climates; yet it would be satisfactory to ascertain their real nature, and also their number, in trees the age of which can be ascertained.

Bombay, 30th June, 1842. JOHN G. MALCOLMSON.

VII.—A valuable collection of Iron ores from Malwan and Gotney, in the Rutnagherry district, presented to the Geographical Society by C. A. Elphinstone Esq., having been arranged in the Museum of the Bombay Branch of the Royal Asiatic Society, we insert two official reports respecting the first mentioned ore, which, we believe, will be new to most of our readers, although they have already appeared in the proceedings of the Bombay Chamber of Commerce.

Extract of a letter from the Honorable the Court of Directors in the Public Department, No. 31, dated the 20th November 1839.

Forwarding a Specimen of Iron ore, found at Malwan near the Sea, in order that its properties may be ascertained by the Court.

Para 48th. We transmit as a number in the packet, a report by Dr. J. Forbes Royle, on this specimen of iron ore, which appears to be of good quality.—

Report on a specimen of iron ore from Malwan in the Southern Concan, by J. Forbes Royle, M. D.

Ores of Iron, as is well known, are extremely diffused throughout India, as in the Himalayas, in the Rajmahl Hills, in the Mysore and Carnatic, and also in the Sichel Hills, especially near Neermull.

The ore of iron which has been so extensively worked in the Porto Novo works, in the district of Salem, occurs there in low hills and in great quantities at the surface.—It is the magnetic oxide of iron combined with quartz—The ore varies much in appearance according as the grains of quartz and oxide of iron are large or small, but the proportion in which the component parts unite is nearly uniform, that is, about 48 of quartz and 52 of oxide of iron are found in 100 parts by weight.—The oxide itself consists of 72 per cent. of iron with 28 of oxygen.—The ore is prepared by stamping, and then separating the

quartz by washing or winnowing.—The fuel is charcoal, upon which the ore is laid, without flux, the bellows are plied for four hours when the ore is found to be reduced; it is taken out while yet red hot; it is cut through with a hatchet and sold to the blacksmiths, who forge it into bars and convert it into steel.—It is forged by repeated hammering until it forms an apparently unpromising bar of iron, but which the Hindoo converts into steel of the best quality.—To effect this, he cuts it into small pieces, of which he puts a pound more or less into a crucible, with dried leaves of the *Cassia Auriculata*, and a few green leaves of *Asclepias gigantea*, or, when this is not to be had, of the *convolvulus laurifolius*.—The object of this is to furnish carbon to the iron. The crucibles clayed over, and about 20 or 24 in number, are built up in the form of an arch in a small furnace and charcoal heaped over them.—The blast is kept up for about 2½ hours; when cool, the crucibles are broken and the steel taken out which is of most excellent quality, but the native process is so imperfect that of 72 per cent. of which the oxide is composed only 15. per cent. of iron is obtained.

In the Sichel hills or Neermull Range where Hornblende slate occurs resting on granite or quartz rock, magnetic Iron ore is also found, from which is made the *woatz* steel employed for ages in making Damascus Sword blades. The minute scales of iron ore are diffused in a sandstone looking gneiss or micaceous schist passing by insensible degrees into Hornblende Slate.—This reduced to a sand is washed in shelving depressions, and the heavier particles thus retained are smelted with charcoal in small furnaces. The iron obtained has, according to Mr. Malcolmson, the remarkable property of being at once in a perfectly tough and malleable state.

As the accounts of these two ores are adduced for the purpose of comparison, it may also be stated for the same purpose, that almost all the celebrated iron mines of Sweden consist of common magnetic iron ore, while those of Orendal in Norway consist of the granular variety or which is commonly called iron sand. Siberia, Elba, Sweden, and the Hartz yield the most powerful magnets, which are also found in some of the mountains of Central India.

The Swedish bar iron, prepared entirely from the magnetic iron-stone of Dannemora, is smelted either alone (or mixed with limestone if it require any flux) with charcoal; and in most of the countries of Europe where charcoal is usually alone employed, the process is very similar to the Swedish.—In England less rich ores are smelted with the assistance of different fluxes, and coke for fuel; but the process is more complicated as well as the apparatus, but is made profitable from the application of science and great practical skill, as well as from the occurrence of iron ore in the vicinity of coal.

The native steel of Gisemhartz is prepared directly from the ore nearly in the same way as common bar iron—no flux of any kind is necessary, and the fuel, which is charcoal, does not on an average exceed in weight 1-5th of the ore.

The specimen of Bombay iron ore submitted for examination is

described as being found in a rocky soil in the town of Malwan in the Southern Concan. The spot is close to the sea, and the ore is dug out in quantities at a very small depth below the surface. There is another mine (formerly worked it is believed) about 4 miles north of Malwan.

This ore has been examined by Mr. Tennant, Lecturer on Mineralogy at King's College, and has been seen by professor Daniell and also by Mr. Lonsdale, Assistant Secretary of the geological society.

It is different from the Salem ore, and also from that of the Neermull Range, in as much as it is but slightly magnetic, while they like Swedish ores, are highly magnetic, and attract iron filings. This is of the kind called micaceous or specular iron ore, and generally occurs in primary rocks in Scotland, England, Norway, and especially in the Isle of Elba, also in Saxony, in Bohemia in beds of Mica Slate, at St. Gothard, &c. An ore very similar to that of Malwan occurs at Tavistock in Devonshire, and at Dunkeld in Perthshire—Mr. Tennant has specimens something like it from Brazil, in which gold is found, and which appears to be mechanically disseminated through the ore.

The specimen of ore sent consists of a very large proportion of the oxide, with reddish granular quartz (that is granular quartz coloured by iron,) disseminated through it.—The proportion cannot be ascertained without destroying the specimen, and therefore several of different degrees of richness ought to be submitted to examination in order to form a correct idea of the value of the ore. The oxide, or more properly peroxide consists of iron 69 parts, and oxygen 31, in every hundred, and is therefore very nearly as rich as the magnetic iron ore, which consists of peroxide of iron 69, and of the protoxide of iron 31 parts. It may however contain other impurities, which will be revealed to chemical analysis. It is probable that both magnetic iron ore and common specular iron ore may be found in the vicinity.

The value of this ore will depend not only upon the facility of extraction and of transport, which appears to be great, but also upon the richness of the ore, which cannot be judged of by a single hand specimen, as the best are usually selected. Information should also be communicated respecting the existence of any flux, such as limestone in its vicinity, as this might be required. Also on the comparative scarcity or abundance of fuel, of which charcoal is the most eligible for this ore.

As the Malwan iron ore most resembles that of Elba, among the ores which are worked in Europe, it may be mentioned that the process adopted somewhat resembles the Indian method, as the ore broken into small pieces is heaped upon a bed of charcoal in a very simple reverbatory furnace. When the whole has been glowing hot for some time, the pieces being now soft and at a welding heat, are, by the dexterous management of the workmen, brought in close contact with each other by means of an iron bar. They are then lightly hammered while still in the furnace, and thus the whole mass acquires sufficient compactness to be removed to the anvil without falling in pieces; it is

now hammered with a gradually increasing force, the earthy impurities are thrown off, together with the scales of black oxide, the lump is divided into pieces of a convenient size, which, by repeated heating and hammering, are drawn into bars. This iron is of excellent quality, and about 50 to 75 per cent. are obtained out of the ore, but owing to the scarcity of fuel, the ore is embarked and taken to the mainland to be smelted as it was when Strabo wrote.

Common specular iron ore generally yields an excellent malleable iron, but somewhat hard, and also a good, but not the very best, cast iron.

The second kind of specular iron ore, called more specially micaceous iron ore, is found in the general way to smelt more easily than the preceding, provided a sufficient quantity of limestone is added to it by way of flux. The iron that it affords is some times cold, short, but is well fitted for cast ware.

Report by Dr. Gibson *on the Iron Ore found at Malwan.*

Dapooree, 28th November, 1840.

In obedience to the orders of Government I proceeded in October to Malwan.

Having arrived there, I made enquiry as to the seat of the Iron Ore, whereof specimens had been furnished to me 9 years ago. I found that several veins existed in the immediate neighbourhood of the Kutcherry. Not more than three of these veins were visible on the surface. Of these, two were opened by me. I found the breadth in each vein to vary from 4 to 6 inches, and from these the Ore was broken out vertically from between the rifts of the quartz rock wherein it was imbedded—the other side of the vein being often formed of sandstone.

I was unable in any case to trace a vein to a longer extent than 8 feet on the surface. Beyond that extent the rock dipped considerably below the surface, and from the want of proper mining tools I could not break up the veins to a greater depth than 18 inches. The specimens sent will many of them shew the full breadth of the vein, and will moreover be found frequently to exhibit the appearance of lumps of solid metal.

On the depth to which these veins extend will the value of the deposits depend. I could not learn that such veins were found in other parts. Analogy and presumptive evidence will lead to the belief that the veins at some distance below the surface may be at least as rich as those which appear superficially, and this belief is further strengthened by observing the immense blocks of quartz rock which abut into the sea, particularly on the side W. S. W. of the Kutcherry. These in their fractures, both horizontal and vertical, appear as if they had been jointed by Iron which had rusted away under the continued action of salt water, and therefore the probability is strengthened that at some distance from the surface, large veins of the pure ore may be found. As to the productiveness of the two veins opened by me,

I may state, that by the labour of a man and boy employed for three days, and having for tools only a pickaxe and crowbar, I raised about 1200 lbs. of good ore.

Of this quantity I deemed that about 200 lbs. might be sufficient for the experimental purposes to which it was intended to be applied by the Hon'ble the Court of Directors. A second portion of the ore I made over to the Assistant Assay Master, as that Gentleman wished to test its value for the fabrication of the finer description of tools, and I knew that no one was better able to do so.

The third and larger portion I made over to a member of the Chamber of Commerce in Bombay, who was most desirous immediately to try its value, in the home market, and to ascertain its feasibility by the great Iron Furnaces in Scotland. Along with Iron Ore specially reported on, I have also forwarded a considerable quantity of the red or Ocherous Iron Ore found in great quantities throughout the Konkan, but especially towards Malwan and Vingorla. Also two specimens of very rich Ocherous Ore found at the village of Gotney in the Rutnagherry Zillah. These latter were kindly handed to me by A. Elphinstone, Esq. The village is situated on the Ghats and at a distance from water carriage.

As to the common Red Ore of the country it seems to prevail throughout, and in the Malwan and Vingorla districts, there are many settlements of smelting establishments; but these are on a small and miserable scale, and if we can credit the returns and the appearance of the workmen, they earn but a bare subsistence. The process they follow differs in no respect from that followed in other districts, where this Ore is found, and consists in roasting, pulverising, and afterwards smelting the Ore. My main object in noticing this red ore is to point out its great abundance, the extreme facility with which it is dug out, and its proximity to the numerous navigable creeks which intersect the Konkan. An analysis of the specimens of it, which have been forwarded, will shew whether it is likely to be of any value as a dead weight for export.

The more pure and rich ore now specially under report being found so near the surface as above described, it may be asked why it has never been worked by the natives? The fact is, that it is too refractory for any heat which they can apply, and appears to be tangible only by the heat of our more powerful European furnaces.

In conclusion, I may, for the guidance of the practical Geologist, give a sketch such as my limited knowledge enables me to do, of the Geological features of the district in which this ore is found. The surface presents a wide table of laterite formation, in some situations level with the sea, and in others swelling into small rounded hills generally thickly wooded, or into bare elevated plains nearly destitute of soil.

Below this lateritious crust appear in some situations, or in the Ramghur district, immense veins of Talc associated with and running into quartz rock, and having an angle upwards of 45° with the surface of the ground and a westerly dip.

This Talc is excavated by the people, and made up or rather shaped out into Cooking Pots, Eating Dishes, &c., and in this way a trifling traffic is carried on—such vessels are valuable to the Chemists, as they are said to be capable of resisting the most intense heat.

I find on referring to Captain Herbert's survey of the mineral productions of the Himalaya, that a trade is carried on in vessels made of this stone to the extent of 40,000 piastres, equal to about 81,000 Rupees. Further Captain Herbert states, that in the Himalaya, as well as in Ireland, Talc, when existing along with primary rocks, has been found to be associated with Copper Ore.

3. In situations where the overlying laterite had from some local cause (qu: the prevalence of lime?) been completely disintegrated into a pastry red clay—below this, I remarked extensive beds of white and soft pipe clay looking substance, originating possibly from the extensive decomposition of quartz rock. I have not yet leisure to examine this substance, nor can I yet say whether it can be turned to any account in the arts—but specimens of this and of all the other minerals found in that part of the country have been sent to Dr. Heddle for the museum of the Geographical Society. Sandstone, I have not observed in the district, save in detached masses associated with quartz rock and bright Iron ore.

The lowest formation visible is this quartz rock very hard, and in many places curiously mottled by the outlines of what seem at one time to have been solid nodules imbedded in the more liquid surrounding rock, but are now of one substance with it, varying from it only in colour.

This quartz rock is remarked by its nearly vertical forms in the beds of the deeper rivers, and appearing extensively below the laterite on the sea shore.

On the whole, the district seems well worthy an attentive examination by the Geologist.

As the nature of my duties afforded me an eligible opportunity for examining the Teak plantations of the Southern Konkan, I deemed that I should be acting in accordance to the wishes of Government by visiting these, and for the inspection of such portions of the said Plantations, as I could not conveniently visit in person, I detached a trust-worthy Peon of the Garden's Establishment, accompanied by a Karkoon, whom I had (with permission of Government) hired for two months for the purpose of assisting in the examination of alluvial soils, and as I had no further use for his services in that branch of enquiry, I turned them to account in the examinations of plantations. As both this man and the Peon had been employed with me in the Northern Konkan and Petti country, on similiar duty, they had some experience on the subject—the results of the Examination made, and observations arising out of it, will be found in Report No. 2.

(Signed) ALEXANDER GIBSON,
Supt. Bot. Garden.

METEOROLOGICAL OBSERVATIONS, BOMBAY OBSERVATORY.

21st OCTOBER, 1841.

Bombay mean time	Hour.	Baromo-ter.	Thermom. Attad.	Thermom. Detad.	Thermom. Dry.	Thermom. Wet.	Corrected Baromo-ter.	Winds.	Remarks.
6	A. M.	29·870	79·0	78·6	79·0	75·0	29.736	S. by W.	Sky clear with cirrostratus.
7	..	·876	79·0	79·0	79·4	77·0	736	S. E.	
8	..	·900	80.0	80·2	80·2	77·0	.757		
9	..	·904	81·3	81·4	81·4	77.0	.757		
9½	..	·900	82·0	82·2	82·2	77·0	.751		
10	..	·900	83·0	82·4	82·8	75·0	.748	S. E.	
10½	..	·894	83·0	83·6	83·6	75·2	.742		
11	..	·870	84·8	84·6	84·5	76 0	.712	S. W.	
0	..	·850	86·2	86.0	86·0	76 8	.689		
1	P. M.	·826	87·2	87·0	87·0	78·8	.662		
2	..	·818	88·2	87·4	87·4	78·0	.651	W. S.	Sky clear with cumulistratus.
2½	..	·818	88·2	87·3	87·4	77·8	.651		
3	..	·812	88·0	86·8	87·2	78·0	.646	W.	
3½	..	·808	88·0	86·0	86·6	77·0	.642	W. N.	
4	..	·808	87·5	86·5	86·8	77·0	.643		
4½	..	.802	86·8	84·8	85·2	76·9	.639		
5	..	·816	86·0	84·2	84·6	76·5	·655		
5½	..	·824	85·0	83·4	83·8	76·5	·666		[6h. 12m.
6	..	·822	84·0	82·2	83·2	76·5	·667	.....	Sky clear. Lightning in the E.
7	..	·850	82.6	81·8	82·2	76·0	·698	.....	" " {in the N. E. 6h. 12m. in the W. 7h. 25m.
8	..	·878	82·2	81·6	82·2	76·0	·728	.....	In the E. {in the N. 7h. 27m.
9	..	·872	82·0	81·6	82·3	77·0	·723	Calm....	Clear.
9½	..	·880	82·0	81·6	82·3	77·0	·731	.....	Clear. Lightning in the N. E.
10	..	·896	82·0	81·5	81·8	77·0	·747	... .	Sky clear. [9h. 30m.
10½	..	·884	81·5	81·2	81·6	76·5	·736	....	Sky clear. Lightning in the E.
11	..	·890	81·2	81 2	81·6	78·0	·744		
0	..	·880	81·0	80·6	81·2	76·8	·734	....	Cumulus in the N. and E. Light- [ning in the E.
1	A. M.	·872	80·5	80·4	80·6	76·0	·727		
2	..	·850	80·5	80·0	80·4	76·0	·705	Calm.. ..	
2½	..	·884	80·2	79·8	80·4	76·0	·740		
3	..	·882	80·0	79·4	80·2	75·8	·739		
3½	..	·884	80·0	79·3	80·0	75 8	·741		
4	.	849	79·8	79·1	80·0	75·5	·706		
4½	..	·840	79·6	79·0	79·8	75·5	·697		
5	..	·846	79·5	78·8	78·7	75·0	·704	.....	Cumulus without Lightning.
5½	..	·844	79 5	78·8	79·6	76·0	·702		

22ND NOVEMBER, 1841.

Hour.	Bombay mean time	Barometer.	Thermometer. Attad.	Detad.	Thermom. Dry.	Wet.	Corrected Barometer.	Wind.	Remarks.
A. M.	6	29·930	76·0	74·4	73·6	71·0	29·799	N. E.	Clear in the zenith with cumuli
..	7	·956	75·6	73·5	73·4	70·0	·828	.....	Cumuli. [in the horizon
..	8	·980	75·8	75·4	75·0	70·8	·849	.....	Cumuli in N. E. passing to th
..	9	·992	75·8	77·0	77·2	71·0	·859	E.	[W.
..	9½	·989	76·0				·868	.....	Cumuli all round the horizon
..	10	·988	78·2	78·3	78·0	72·1	·850		[Mass in the west passing to E
..	10½	·989	79·0	79·2	79·8	72·6	·849	.....	Cumuli in the horizon. Masses i
..	11	·980	79·8	80·2	80·8	72·8	·837	N. W.	„ mass in the N. & E. [the N
..	0	·950	81·0	81·3	81·2	72·0	·804	.....	„ masses in the N. and S. E.
P. M.	1	·920	81·5	81·0	81·6	71·5	·777		
..	2	·888	81·9	81·1	81·8	71·4	·739	.....	Large cumuli in the N. E. & S
..	2½	·886	81·9	81·2	81·2	71·6	·737		
..	3	·896	81·6	80·9	81·0	72·0	·738	.....	A few large cumuli in the N. S
..	3½	·884	81·6	80·9	81·0	71·6	·736		[and E
..	4	·882	81·4	80·7	80·8	71·0	·732		
..	4½	·882	81·0	80·4	80·6	70·2	·732	.....	Cumuli in the East.
..	5	·888	80·6	80·4	8·00	70·6	·738	.....	„ in the West.
..	5½	·900	80·1	79·4	79·1	71·0	·757	.....	„ in the E. and W. Zenith clear
..	6	·900	80·0	79·2	79·0	70·5	·757	N.	
..	7	·922	79·2	78·6	78·6	71·0	·781	.....	Sky clear.
..	8	·936	79·0	78·4	78·4	71·5	·796		
..	9	·950	78·6	78·0	77·4	72·5	·811	N. E.	
..	9½	·950	78·6	77·8	77·2	71·8	·811		
..	10	·950	78·1	77·2	76·4	70·5	·813		
..	10½	·950	78·0	76·8	76·2	70·8	·813		
..	11	·948	77·6	76·8	76·2	71·4	·814	.....	A few cirri.
..	0	·946	77·5	76·7	76·2	71·8	·812		
A. M.	1	·939	77·2	76·6	76·0	71·0	·795	.....	Sky clear.
..	2	·916	77·0	76·5	76·0	70·8	·782		
..	2½	·916	77·0	76·3	76·0	70·8	·782		
..	3	·924	76·8	76·0	76·0	70·8	·790		
..	3½	·928	76·6	76·0	75·6	71·2	·787		
..	4	·920	76·4	76·0	75·5	71·6	·786		
..	4½	·918	76·4	76·0	75·3	71·5	·786		
..	5	·924	76·4	76·0	75·2	72·0	·792	.....	Cirrus with cumuli in the E.
..	5½	·940	76·2	75·8	75·2	71·8	·806		

21st DECEMBER, 1841.

Hour.	Barometer.	Thermom. Dry.	Thermom. Wet.	Diff.	Attad. Thermo.	Dord. Thermo.*	Remarks.
0	29·887	72·2	66·5	5·7	73·6	72·5	
1	·874	71·6	67·0	4·6	73·2	72·2	
2	·868	71·0	67·0	4·0	73·0	71·7	
2½	·868	71·0	66·6	4·4	73·0	71·6	
3	·868	71·0	66·6	4·4	72·9	71·6	
3½	·870	71·5	65·5	6·0	72·8	71·9	
4	·864	71·6	66·5	5·3	72·8	72·0	
4½	·872	71·2	65·8	5·4	72·5	71·8	
5		70·3	65·0	5·3	72·0	70·7	
5½	·880	70·3	65·0	5·3	72·0	70·7	
6	·895	69·7	65·0	4·7	71·7	70·0	Clear.
7	·908	69·0	62·0	7·0	70·7	69·0	
8	·936	71·4	65·0	6·4	71·0	71·0	Cumulus in the West.
9	·974	74·3	66·0	8·3	73·2	74·5	
9½	·984	75·2	67·0	8·2	74·0	75·3	Clear with cirri and cum.
10	·974	76·0	67·0	9·0	75·0	76·4	
10½	·956	76·7	70·0	6·7	76·0	77·0	
11	·950	76·7	70·0	6·7	76·2	77·0	
0	·920	77·0	70·0	7·0	77·0	77·0	Clear with cum. N. W.
1	·894	77·0	68·8	8·2	77·2	77·0	
2	·872	77·5	70·0	7·5	78·0	77·7	Clear.
2½	·872	78·0	69·8	8·2	78·4	77·8	
3	·872	78·5	70·0	8·5	79·0	78·0	
3½	·872	78·6	69·3	9·3	79·0	78·0	
4	·878	78·6	69·3	9·3	79·0	78·0	
4½	·880	78·0	68·0	10·0	79·0	77·9	Fresh breeze. Cirri E.
5	·880	77·0	68·5	8·5	78·5	77·3	Clear.
5½							
6	·890	76·0	68·8	7·2	77·0	76·2	
7	·920	75·6	69·0	6·6	76·1	75·7	
8	·940	75·1	69·0	6·1	75·9	75·4	
9	·940	74·4	69·6	4·8	75·5	75·4	
9½	·940	73·8	68·0	5·8	75·0	74·6	
10	·938	73·0	67·0	6·0	74·6	74·0	
10½	·936	72·6	66·0	6·6	74·2	73·2	
11	·926	72·0	67·4	4·6	73·5	72·5	

* This last column contains the observations of the standard Thermometer. Sky clear.

JOURNAL

OF THE

BOMBAY

BRANCH ROYAL ASIATIC SOCIETY.

APRIL—1842.

ART. I.—*Girnar Inscriptions.*

THE following extract of a letter from Captain JACOB, Political Agent Katyawar, addressed to the Secretary, will explain the reasons for republishing those of these inscriptions which formerly appeared in the *Journal of the Asiatic Society of Bengal*;—

"MY DEAR SIR. "*Rajcote, 4th July*, 1842.

"I enclose the Geernar Rock Inscriptions, most carefully compared, "the joint labour of Mr. WESTERGARD, a young Brahman protegé "of mine, and myself. They may be depended on as perfectly "accurate. Mr. WESTERGARD will be in Bombay about the time you "receive these, if not before, and has kindly undertaken to correct "the proof sheets. I should be very glad to see our Society the "first to give them to the world in their perfect state;—perfect only "as far as the Goths and Vandals of the country have left them, of "course I mean."

ART. II.—*Inscription copied from an ancient Tablet, found at Nágpúr, (Nagpore) with the same in modern characters, accompanied by a Translation, and with some remarks, by the* REVD. DR. STEVENSON.

THE copy of the Inscription I now lay before the Society, with a transcript in Devanâgari, and a translation of the greater part, was

received some time ago by L. R. REID, Esq., Chief Secretary to Government, from Major WILKINSON, Resident at Nagpore, and by the former gentleman committed to me to decypher, and translate.

It consists of two parts, the former containing seventeen lines, and the latter three. It is the former only that I have decyphered and translated. There are in it a few breaks at the ends of some of the lines; but as they are small, it is not difficult from the connexion to make out the sense. The latter has two considerable *lacunæ* in the middle of two consecutive lines; and besides from what I made out of it, consisting apparently of nothing but an eulogy of Shiva, I did not deem it worthy of the examination it would have required to make anything like a full translation. The character in which it is written seems about a couple of centuries more modern than that of the former inscription, which is intrinsically of considerable importance, as affording direct proof that up to a period comparatively recent, the Buddhist ascendancy was maintained in the East of India.

The tablet from which the transcript is taken, was probably originally attached to a building destined for Buddhist ascetics by a Sovereign of that faith. The country over which the Sovereign ruled is called Urísí,* most probably Orissa, which is full of Buddhist antiquities, and where a powerful dynasty reigned in ancient times. The Sovereigns whose names are mentioned in this Inscription, are Surya-Ghosha, Kutsa, Udayana, and Bhava-Deva. Although none of these kings are mentioned in the list given by STIRLING in his account of Cuttack, yet he omits, as he tells us, thirty-two kings of the Kesari race; and these may yet be found among them. It is also to be observed, that his principal authority—the record kept in the temple of Jagannath—was only commenced in the eleventh century, and that it says nothing of any of the previous sovereigns being of a different religion, though from this inscription, written by a Brahman, it evidently appears that the three last at least of the above-mentioned kings were Buddhists; and that in the temple record it is expressly said, that the last of the Kesari race of kings was driven from his throne on account of a dispute with a Brahman. Most likely, then, all the previous Sovereigns were Buddhists, and with a change of dynasty there was also a change of religion, and a persecution of those who adhered to the ancient faith, as disaffected subjects of the new sovereign. Probably, also, most of

* May not this mean "the many sages?"

those splendid temples, for which Orissa is famed, were reared by these sovereigns. The famous Black Pagoda at least must have been so, as the principal figure above the principal gateway, as drawn in the *Asiatic Researches*, VOL. XV., *p.* 330, is a Buddha: nine Buddhist sages are ranged under it, and nine more on each side of the doorway. In STIRLING'S account, these are said to be the nine planets. It may be so, but then they were so represented by Buddhists; for the Braminical figures to represent the planets are quite different. The modern Hindu sovereigns of the Ganga race to whom these works are ascribed, probably only repaired them, and converted them from Buddhist to Braminical temples,—a thing that has happened to many Jain temples in Gujarāt and Central India,—to one only a few years ago.

The Inscription is written in lines of modulated Sanscrit prose, by a Brahman; so that it would appear that even then, by their astrological knowledge and usefulness in transacting business, the Brahmans were climbing the ladder of that ascendancy to which, in a century or two after, they attained.

The date of the Inscription is unfortunately not given in figures, but the two words *Shivo Jvála*, which follow immediately सं, the abbreviation for Samvat, I have no doubt contain the date, which is therefore 711, or A. D. 657.* This conclusion also harmonizes both with the style of the letters, as compared with those of an earlier and later date in PRINSEP'S Alphabets, and also with the state of Eastern India, as described by a Chinese traveller of that age, as so well illustrated by Colonel SYKES in his late paper on the state of Ancient India.

Although the general tenor of the Inscription is obvious and determinate, several minor difficulties have presented themselves, in executing the translation. Not having the original to refer to, I have not taken any liberty with the transcript, nor even with the Devanâgari substitutes, except in one or two obvious instances, where there could scarcely be any doubt that one similar letter had been put by mistake for another. In other instances, where no sense seemed to result from the letters as they stood, I have made the best conjecture I could in forming the translation, leaving the Devanâgari unchanged.

* Shivo is plain, and Jvala in the Kosha is synonymous with Agnijivha; and in the Smriti Agni is said to be Saptajivhah; also in Rig-Veda I. Ashtaka 8. Adhyaya 26. Varga.

These difficulties have, fortunately, relation only to some words in the profusion of epithets heaped upon gods, and heroes, and not to the general scope, or to the important points on which I have based my remarks relative to its Buddhistical character.

ADORATION TO THE TRIAD.

1. Thou, the god of surpassing wisdom, the possessor of the antelope-ruling (moon,) the bearer of the terrible barbed trident, the invincible sender of victory, the vanquisher of armies, comest for our salvation, seated in thy easy chariot, conquering and slaying (our foes); often celebrated as our deliverer, thou always presentest thyself full of good qualities. Now let the goddess held in his hand, and him the holder of the goddess of prosperity, the father distinguished by his crest, the destroyer of pain, the fascinator of the world, preserve you.

2. May he preserve you, who is lifeless, yet living; confined, yet moving every where; the elementary principle of the world, yet being of a tranquil disposition; visible, yet altogether invisible; who delivers the world from fear, and yet is the cause of fear; who receives without emotion the intense fire of Cupid's radiant shafts, and yet is the father and mother of cities and their inhabitants; whose measure has been ascertained, and yet who is immeasurable. Let him who is the darkening waterless fog, and at the same time the thunderbolt-irradiated water-distilling cloud, preserve all in every place.

3. The Sovereign Lord of Urísí (Orissa) crowned with a tiara and garlands, adorned with rubies, and from uninterrupted ever-increasing acts of merit incapable of falling into *sin*, was SRI SURYA GHOSHA, who, like the sun, embraced all in his one circle, virtuous and holy, famed throughout the world, active and truthful.

4. Armed with a sword and mace, his rapid march humbled the earth. Greatly prospering, and served by the wives of his enemies, resplendent with ethereal radiance, he diffused a dazzling lustre in every part of the world. Surrounded with heroes, praised by the dark goddess as endued with the mind of Bhishma, and himself distinguished for a magnitude equal to that of Bhíma and Mahodara, illustrious and ever prospering, he took captive all he met.

5. At length he, the refuge of the good and bad, having begged permission to attend at the feet of the divinity, obtained freedom from worldly existence in the highest heavens ; and in addition, perfect union with the Deity.

6. As an overjoyed hero standing behind the flash of his sword, was LAKSHMI, whose most delightful mansion was the breast of the world-sustaining lord, and into whose pure ocean fame entered as naturally as a bullock the plough.

7. With the weapon that cleaves the temples of the drum-bearing furious elephant, she in one open, breath-dividing battle-field, after another, with her well-sharpened keen-edged sword coursed during night, hither and thither like a lion, who with his claws procures what satisfies his appetite. By her heroism a heroine, and connected with a heroic family, she attaches herself to such, as the brilliant safflower to the sides of the lakes.

8. Her beloved son having died by falling from a lofty eminence in the place where he resided, KUTSA,—a most excellent person, a very Indra,—after passing through many births in which he performed mighty and famous actions, became lord of the earth. But the love of the Creator, and devotion to the pervading energy of the universe, converted him, and made him regardless of the business of the world, and a man wholly intellectual.

9. Having, therefore, seen that the only way to lay hold on the unfading star of life was by crossing the ocean of this world, he, as an ascetic (Yati,) went over the awfully resplendent, invincible, Himalayan mountains, to the sage's (Muni's) established seat.

10. After having for a long time journeyed patiently, enduring privations, the associate of bears, and ravenous beasts, the lord of the earth married one of the Pandava family, and a child called UDAYANA being born to him, he had the happiness of possessing a son.

11. When he had obtained union in the heavenly mansions, (his son,) the royal holder of the divine treasures, who hurled afar the foe-terrifying discus, who through fear of the destroying god and infernal pains restrained his own spirit, who cherished his own powerful host, and destroyed the multitudes of his foes, and every where inspired silence, became the incarnate deity who sustained the weight of the earth.

12. The settler of his subjects, the conferer of merit, the deity that carries on the affairs of the world, such was BHAVA-DEVA his fourth son.

13. He, marching forth armed with a dagger, and weapon resembling the nails of the hand, went into the field of battle, tearing his foes to pieces, and like a roaring lion destroying his enemies, those furious elephants.

14. How should it be that through pain the serpent that bears the world should cast its earthy load from its head, and that its forehead should no more be able to perform its appointed task, and to keep the world steady? No more could the king do so, who held the place of the pole, to which the yoke is attached, was a mountain to sustain his subjects.

15. Without levying any capitation tax, or traversing the provinces, distinguished as the unexampled cherisher of the earth, he was a very Vishnu (husband of Lakshmi.) With his friend, the beloved Girimukha, dear to his heart, and ever agreeable, by whom as by fresh flowers the universe [was perfumed,] the sovereign of the world, the supreme king, having adopted the path of religion as an ascetic (Yati,) wandered through Turu,* exerting his mind in the study of holy science, rooting out his vices, and every day resembling the full moon. His undecayed body like a heap of yellow gold, at last assumed a dark red colour, till all the hateful fuel of passion being consumed, he became wholly glorious for the welfare of men.

16. Fulfilling all the desires [of the sages], every where raining down blessings, no stain was anywhere to be found, nor fear of calamity.

17. Distinguished for his beauty among the people, pleasing the eye, in gifts excelling Karna, and in wisdom Brihaspati, speaking mildly even to his enemies, celebrated in the Jagati measure, beloved, and even named blessed.

18. By him the naked ascetics (Nagnagana) [were supported.] Whose disposition ever sweet, increased to such a degree as not only to refuse ordering the destruction of human life, but constantly to

* This must be Turan or Tartary, and since his grandfather crossed the Himalayas, he probably did so too. Perhaps Tibet might be included under this name, and a visit to the Grand Lama one object of the pilgrimage.

sustain himself by water, so that he might be considered as attaining the supremacy of the serpent race (who live on water,) though not like them double tongued. He was at the same time fortunate, and a rewarder with the five different jewels of his victorious troops.

§ 19. He possessed the depth of the sea, and the stability of things on the dry land, and of the human body sustained by its seven members, the benevolence of descendant of the Sun (Karna,) so that by merely presenting themselves suitors, ever obtained their request. His fame and majesty were equal to those of Raghu. Whenever he, with his warriors, would go into the battle against towers, and horses, he inspired his foes with anxiety, whereby war-sprung voracious indifference to life seized the far-famed goddess Durga.

20. By whomsoever this his land, and the house of the sage (Sugata) shall be protected by virtuous and strenuous efforts, to him let there never be any danger of falling into the regions of Pluto (Yama,) inhabited by venemous serpents; but on the contrary, let his delightful habitation be where are collected those distinguished for their knowledge of the Veda, and for acquaintance with all the modes of chanting its sacred verses. Let it be peaceful and honored for sacred science. And even should he be born in a low and vicious family, let him, when sufficiently old, become a devotee (Brahmachári,) and awakened to devotional exercises take refuge in the most ancient of beings. The virtuous (sovereign) having become a perfect Buddhist sage (Boddhisatva,) obtained renovation.

21. This is the much ornamented spot adorned with lakes, wells, garden lands, halls, small dwellings, and sacred trees with numberless suckers, surpassing all former splendour,—a delightful cheering place, friendly to man, flowing with the water of life. Let this abode of the illustrious conqueror of the passions (Jina) remain ever glorious.

This eulogy, composed in excellent rhetoric measures, desired by his family, his fortunate dependants and friends, was composed by Bhâskar Bhatta in the year (Shivo Jválá) 711. ᳐ ᳑ ᳒ Thus [departed he] who was nothing less than the friend of all (Vishnu,) contemplating the goddess of eloquence and prosperity, as she resembled a drop of pure water, resting on the leaf of a lotus; and at the same time guarding the life of man.

ART. III.—*A Collection of words from the language of the Todas, the Chief Tribe on the Nilgiri Hills. Communicated to the Society by the Rev.* DR. STEVENSON.

THE following collection of words was made by the Rev. Mr. Greiner, of the Mangalore German Mission, while residing for a season on the Nilgiris. The comparison with the other languages of the Indian Peninsula, and with the Sanscrit, was made by the Rev. Mr. Weigle of the same Mission, and by the help of Meninski, Klaproth's Asia Polyglottica, the Journal of the Asiatic Society of Bengal, and Indian Dictionaries, I have carried the comparison partially to the other Indian languages, and even to languages beyond the confines of India. The general results of these comparisons are the following :—

1. The language of the Todas is a sixth kindred Indian Peninsular language; the Telugu, Tâmil, Carnâtica, Malayâlim, and Tulu being the other five. All of these languages have but one origin; and an intimate connection both in grammatical construction, and in the vocables that are used, runs through them all. More especially the points to which I adverted in a former paper, the use of *n* to mark the genetive singular, of *k* to mark the dative, of *t* or *d* to characterize frequently the past tense of verbs are all found in the language of the Todas.*

2. The language of the Todas has a strong resemblance to the language of other Indian hill tribes; especially to that of the Brâhoes, a tribe inhabiting the mountains of Scinde, and like the Todas, men of fine features and having an evidently Caucasian cast of countenance; so much so that the Todas have been mistaken for a Colony of Greeks, and the Brâhoes for one of Jews.

3. Beyond the boundaries of India the Turkish, Siberian and Persian languages furnish the greatest number of analogous words, especially of words expressive of the common relations of life, and denoting objects with which men in an imperfect state of civilization are acquainted.

4. Words derived from the Sanscrit seem to have been communicated to the Todas by the inhabitants of the neighbouring plains, and are usually such as express ideas connected with a higher

* I here take occasion to correct an error in my Essay on the language of the Aboriginal Hindus, published in the last No. of the Journal. The Tamil under the 10th head is said to differ from the other languages of India in not using the nominative for the accusative, whereas it agrees with them.

state of civilization, or are the names of objects naturally foreign to their mountains.

5. Several words are found almost entirely the same as those expressive of the same idea in the Mongolian and Celtic tongues;—languages spoken by tribes so different, the one in physical structure, and the other in geographical location; and the instances to which I refer are such as could not have been the result of accident, but must have arisen from a connection at some previous period of their history. Thus, the word *Gurri* for sheep, which in Canarese is *Kurri*, is almost the same as the Irish *Kaora*, of the same signification. *Arl*, a star, approaches very near to the Irish *Reall; Tata*, fire, to the Celtic *Tan*;* *Tora*, food, to the Celtic *Torth*, a loaf; and again *Kol*, the foot, has a strong resemblance to the Canton Chinese *Koh*; and *Noi*, a dog, to the Mongolian *Nokoi*; and *Mata*, the head, to the Tibetan *Mago*; and *Anaga*, the face, to the Tibetan *Ngo*.

There are also strong traces of a remote connection with the Semitic languages. Thus, the pronoun *An* for I, is almost the *Ani* of the Hebrew, and *Ana*, of the allied languages. *Duru*, to burn, or as in Canarese *Uriu*, is not only nearly the *Uro* of the Latins, but also the Hebrew *aur*. *Mata*, the head, is nearly the Arabic مطس maatas the face. Owing to the want of types and compositors for the Southern Indian languages, it has been found impossible to express the words of those languages in their native characters. Mr. Mœghlin's scheme for their expression in Roman and Greek letters precedes his catalogue of words. It is from his MS. that all that follows, not included in crotchets, relative to those languages, and the Sanscrit, has been taken.

NOTES RELATIVE TO THE ORTHOGRAPHY.

1. The expression of Sanscrit letters in English characters [being nearly conformed to the system of Sir William Jones] will, it is hoped, be intelligible without explanation. The Linguals [or as they are called by the native grammarians Cerebrals,] are expressed by Italics, likewise the hard l (ळ of the Balbodh.)

2. Three Greek letters have been used to express three letters that are peculiar to the Southern dialects, and chiefly to the Tamil. They are (1) a very soft sound between *l* and *r*, the final of the word Tamiλ.

* *Beta*, a mountain to *Ben*; the *t* in this and in the word for fire being converted in the Celtic to its nasal *n*. The word *Meya*, a son, especially in the Canarese form *Maga*, is but a small remove from the Gaelic *mak*. Surely after this the McPhersons and the McGregors of our Highland glens need not hesitate to claim as Scotch cousins, the inhabitants of the Indian Peninsula.

This is expressed by λ. [It corresponds somewhat to the French j and Persian ژ] (2) a nasal peculiar to the Tamil language, nearest to, but not identical with, the *dental* nasal of the Devanagari system. It is expressed by ν the Greek *n* [it is almost the English n.] (3) a very harsh *r*, expressed by ϱ the Greek *r*. This letter produces in the Tamil and Malayalim languages two compound sounds; the one a double *t* with a slight *r*, (ttra, as it were, but very softly.) This is expressed by ττ, a double Greek *t*. The other used in the Malayalim, is an *nd*, likewise with a scarcely perceptible shade of *r*, (ndra.) This is here written νρ for instance yeνρu (Sanscrit दृति)=yendru.

NUMERALS.

	TODA.	TAMIL.	CARNATAKA.	MALAYALAA.	TULU.	VARIOUS AND REMARKS.
1	Vodda	Oνρu	Ondu	Onnu	Onji	*Lat.* unus. *Tunguzian* Mukom. *Koibal*, unem
2	Yeda	Irandu	Yeradu	Randu	Yeradu	*Tunguzian*, djuhr.
					Vulg randu	*Armenian*, yergu.
3	Mudu	Muνρu	Muru	Muna	Muji	*Brahui*, irat.
4	Nank	Navku	Nalku	Nalu	Nalu	*Brahui*, musit.
5	Khu	Eintu; vulg. anchu	Eidu	Anchu	Eini	
6	A'ra	A'ρu	Aru	A'ρu		*Can. Chinese* ing.
7	Yo	Yeλu	Yelu	Yeνλu	Aji	*Turkish*, alti. *Yennesse*
						ram, agam.
						Armenian, yeotn.
8	Yeta	Yettu	Yentu	Yettu	Yelu	*Armenian*, ut. *Lat.* oc-
						to. *Eng.* 8 *Sans.* ashta.
9	Yenbot	Oνbatu	Ombattu	Ombatu	Yenumo	This means 1 less than 10.
10	Pota	Pattu	*Ancient* pattu	Pattu	Ormbo	*Tibetan*, bachu. bet.
			Mod. hattu		Pattu	*Can. Chin.* nat.
11	Ponoda	Pat-in-onsu	Hannondu	Pat-in-onnu	Pati-onji	This is 10 and 1.
12	Ponneda	Panniranndu	Hannerdu	Pantrandu	Paduradu	The Toda though short is
13	Pommudu	Patin Muνgu	Hadimbru	Pattimunna	Padimuji	not less regular: pank:
14	Panka	Patinaulu	Hadinalku	Patinalu	Paduualu	po-ank. pochi: po-ichi
15	Pochi	Patinaenchu	Hadineidu	Patinanchu	Paduneinu	Para=po-ara.
16	Para	Pat-in-aρu	Had-in-aru	Pat-in-aρu	Pad-un-aji	Paya=po-yo.
17	Pa, paya	Pat-in-eλu	Had-in-elu	Pat-in-eλu	Pad-un-eda	Pota=po-yeta.
18	Pota	Pat-in-ettu	Had-in-entu	Pat-in-etta	Pad-un-enemo	Ponabota=poyonabota.
19	Ponabota	Pattonbatu	Hattombhattu	Pattombata	Padunombo	
20	Yepota	Irupatu	Ippatu	Irivata	Irvo	
30	Mupota	Muppata	Minattu	Muppata	Muppo	
40	Nalpotu	Naρpatu	Nalvatta	Nalvata	Narpo	
50	Yebota	Eimbatu	Eivattu	Eimbata	Eivo	
60	Arota	Aρupatu	A'rvattu	A'Νρuvata	Ajivo	
70	Yelota	Yeλupatu	Yeppatu	Yeλuvata	Yelpo	
80	Yetvota	Yenpatu	Yembattu	Yembata	Yenapo	
90	Yevabota	Tonnuρu	Tombattu	Nonnuρa	Sonupo	
100	Nuru	Nuρu	Nuru	Tuρa	Nedu	

NOTE.—*The idea of ninety seems to have been "remaining below a hundred." In Tamil and Malayalim the word for 900 is rayoddam, "wanting (a hundred) to a thousand." The strange form in the Toda may be explained from the word vei to stay behind, i. e. 90 is the 10 that has not yet reached 100.*

II.—NOUNS OF RELATIONSHIP.

1.—Aph, mother; *Tulu* appe; *Georgian* deda.

2.—En, father; *Tulu* amme; *Himalayan Linbu* amba; *Mongolian* ama; *Georgian* mama.

N. B. In many Indian languages *Appa* means father, and *Ama* mother. So that in the Toda and Tulu languages the meanings are reversed. The Georgian has a similar reversing of the common meanings of *Dádá* and *Mámá.*

3.—Olera, a husband; *Canarese alu*, a man; *Malayala*, ula, the head of a family; *Turkish* er, a man; *Arabic* ولى wali, a friend, a a prince; *Yenneseyan** alut, a wife.

4.—Dujma, a wife; *Yenneseyan* dachaim; *Tibetan* chhumgma.

5.—Ono, elder brother; *Can.* anna; *Tam.* annen; *Motoriach*† orgaeda, brother; *Lepcha*‡ anun.

6.—Okena, elder sister; *Can.* akka; *Tulu* akke; *Maratthu* aka; *Tungusian* aki, a brother; oki, a sister; *Mongolian* egechi; *Lepcha* anon, eldest sister.

7.—Uraveda, younger brother; *Tam.* uria, belonging to.

8.—Oraveda, younger sister; *Tam.* uravor, related persons; *Arab.* ارم arum, origin, stock; *Motorisch* hedia, a sister.

9.—Meya, male child; *Can.* maga, a son; *Mal.* magan; *Tulu* mage; *Lat.* mas, a male; *Gaelic*, mak, a son; *Tibetan* miha, little man, and maga, son-in-law; *Brahuí* mar, a son.

10.—Kuya, female child; *Mal.* kunyu [*Sans.* कन्या kanya.]

11.—Amona, mother's brother; *Mal.* ammon; *Telinga* menamama; *Marathi*, mama; *Arabic*, ام umm, a mother; *Lepcha*, anen.

12.—Mami, elder brother's wife; *Can.* mami; *Mar.* mami; *Tib.* Rmomo.

III.—PARTS OF THE BODY.

1.—Boi, mouth; *Can.* baí; *Tam.* vai; *Persian* پوز poz; *French*, bouche; *Pers.* بوسی bosi, kissing; *Tib.* ho, a kiss; *Bráhúí*, ba, the lip.

2.—Kona, eye; *Can.* kannu; *Tam.* kan; *Bráhúí* khan.

* A name for several languages of Siberian tribes living on the Yennesey river.

† A Siberian language.

‡ A Himalayan language.

3.—Kommunu, face; *Mal.* koma, cheek.

4.—Anaga, cheek; *Mal. annakka*, palate and inside of the cheek; *Tib.* ngo, the face.

5.—Moi, whiskers; *Mal.* misha; *Mar* mishi; *Tibetan* sma-ra; *Pers.* موی moy, hair.

6.—Mebhoi, upper lip; *Can.* melvai; (lit. upper mouth.)

7.—Kiboi, under lip; (the *Tam.* kiɻ, *Can.* kel, &c. means under.)

8.—Kavi, kaphi, ear; *Tam.* kevi; *Can.* kivi; *Bráhui* khaff; *Mar.* and *Hind.* kan; *Sans.* कर्ण karna.

9.—Konagoda, eye brows; (i. e. kona, eye, and goda, a cover.)

10.—Kei, hand, (same in Can., *Tamil*, &c.) *Pers.* and *Arab.* کف kef; *Sans.* कर kara; *Yenneseyan* kehar; *Siberian*, ki.

11.—Beve*da*, thumb; *Tam.* perviral, (the great finger); in *Tel.* velu is finger, hence ve*da*; *Can.* beralu; *Mar.* pere*n*, joint of a finger.

12.—Kove*da*, kon*ve*da, second finger, (lit. eye finger; and in *Tam.* kanirral, i. e. as in German, pointing finger.)

13.—Polve*da*, third finger; (perhaps snake finger, *Tam.* pambu ve*da*.)

14.—Pon*ve*da, fourth finger; (lit. gold finger; the idiom in German is the same) T*am.* ponviral.

15.—Chinakun*da* ve*da*, (lit. small pointing finger); china in T*am.* and *Can.* means small; *Mal.* chun*d*ole, pointing finger.

16.—Utura, gums; T*am.* and T*el.* iru; *Pers.* ارد arah, root of the teeth.

17.—Ku*ta*, the lock of hair on the head called in most Indian languages jata; *Mal.* kuduma.

18.—Mira, hair; *Tam.* mayir; *Armenian* mas; *Pers.* موی moy.

19.—Ma*ta*, head; *Mal.* mi*ta*, face; *Mar.* माथा matha; *Tib.* mago, head; *Arab*, معطاس maatas, the face.

20.—Kon*r*ula, the bulb of the eye; (*Can.*, T*am.* &c., kan, eye, and urulu, orb, globe.)

21.—Pa*p*a, teeth; T*am.* pa*ll*u; T*el.* pa*nd*lu; *Can.* hallu; T*ulu* pa*ll*u; *Lepcha* apho.

22.—Nopu, tongue; T*am.* nakku; *Mal.* na, and navu; *Can.* nalige; *Samojeidan* nawa; *Georgian* nina.

23.—Kol, foot; *Can. Tam. Tel. Mal. Kal.* kalu; *Mongolian*, koel; *Pers.* kalluh, the ancle; *Mar.* खोट khot, the heel; *Canton*

Chinese, Koh, the foot; *Finnish*, kok; *Tib.* rkang.

24.—Peda, the belly; *Bráhui*, pid; *Hindi* and *Gujarattee* पेट pet; *Singhalese* phaddh; *Can.* potte; *Mar.* pot; *Tib.* phob; *Canton Chin.* fat; *Pers.* پت put, the liver.

25.—Najagudi, the breast; *Mal.* nenju.

26.—Ura, nail; *Tam.* ugira; *Can.* and *Tulu* uguru; *Tel.* goru.

IV.—MISCELLANEOUS NOUNS.

1.—Palа, milk; *Tam.* and *Mal.* pal; *Can.* palu, or halu; *Affghan* poy, *Sans.* पाय paya.

2.—Tata, fire; *Tulu.* tu; *Mal.* ti; *Samojeidan* tu and ti; *Motorisch* tuek; *Celtic*, tan; *Pers.* تیز tigh; *Sans.* तेजस tejas.

3.—Bakha, smoke; *Can.* poge; *Tam.* pugei; *Eng.* fog and smoke.

4.—To. a door; *Mal.* ta, a lock.

5.—Mukali, a three legged table; *Can.* muru, three, and kal, foot.

6.—Taraga, a plate; *Mal.* talika, a dish.

7.—Nei, ghee, melted butter; *Tam.* and *Can.* the same.

8.—Bena, butter; *Can.* benne; *Mar.* loni.

9.—Barri, roof of a house; *Tam.* pugam, outside of any thing.

10.—Gurri, sheep; *Can.* kurri; *Irish* Kaora; *Turk.* koi; *Mong.* goni, koni; *Georg.* chhuri.

11.—Kas, money; *Tam.* the same.

12.—Ten, honey; *Tam.* ten; *Can.* jenu.

13.—Malurdate, rain; *Can.* male; *Tam.* malei.

14.—Min, a star; *Mal.* min, something bright, a star; *Eng.* moon.

15.—Arl, a star; *Irish* reall.

16.—Keta, a star; *Sans.* केतु a planetary node.

17.—Min, a fish; *Can.* minu; *Sans.* मीन mína.

18.—Pula, a bird; *Tam.* pul; *Eng.* fowl; *Lat.* pullus.

19.—Nir, water; *Can.* niru; *Tel.* nirla; *Tul.* ni; *Brah.* dir; *Sans.* नीर. N. B.—This word has probably been introduced into the Sanscrit from the languages of Southern India, as probably others have been.

20.—Tenka, cocoanut; *Tam.* tenkai; (lit. sweet fruit,) *Mal.* tenga; *Can.* tenginakai.

21.—Buttu, sweetmeat; *Tam.* and *Hind.* mittai.

22.—Mijti, lightning; *Can.* minchu; *Tam.* minnal; *Tel.* merussu.

23.—Avini, avala, love, desire; *Tam.* aval, to desire; *Mar.* आवड avad, love.

24.—Yelaλa, night; *Can.* eralu; *Tulu.* irlu; *Japanese* yoru.

25.—Bagalu, day; *Can.* and *Tam.* pagal, *Mod. Can.* hagul; *Yenniseyan,* heg.

26.—Nalada, day; *Tam.* nal; *Tel.* nadu.

27.—Sammata, power; *Sans.* सामर्थ्य

28.—Melloka, heaven; *Tam.* and *Can.* mel, mele, upper and लोक

29.—Churi, a knife; *Can., Mal., Hind.* &c. the same [Sans. क्षुरी.]

30.—Tikamukhu, steel; *Turk.* چقماق chaqmaq; *Can. and Mal.* chakkamukhu.

31.—Kabina, iron; *Can.* id; *Brahui,* ahin.

32.—Tegina, cocoanut oil; from teng and yena oil, both common to all the Southern languages.

33.—Bara, a line in the hand; *Tam.* varei, a line; *Can.* baraha, writing.

34.—Kunga, a bell; *Mal.* kinkini.

35.—Bala, value; *Can.* bele; *Tam.* vilei; *Hind.* and *Mar.* बोल bol.

36.—Bisma, poison; Sans. Hind. Mar. &c. विष.

37.—Nara, small ribbon; Tel. Nada.

38.—Tosha, leather; Tam. tol; Tel. tolu; Can. togalu.

39.—Nusλa, thread; Can. and Tam. nulu.

40.—Barosh, a year; Sans. वर्ष, of which corruptions are found in all the Indian languages.

41.—Are, half; Tulu are; Can. ara; Sans. अर्द्ध.

42.—Bisλa, the sun; Tam. veyil; Can. bille, white shining; Pers. بلک bilk, a spark of fire.

43.—Tagala, the moon; Can. tingalu; Tam. tingal; Siberian, thyles; Tibetan zla; Mar. ingal, a live coal; Engl. ingle, a fire.

44.—Arasa, a king; Can. arasu; Tam. irasen; Sans. राजा.

45.—Beta, a mountain; Can. Betta; Celtic, ben; Motarisch, bija; Mar. बेट bet, an island.

46.—Kotu, a cliff; [Sans. कूट.]

47.—Bakatu, a cliff washed by water; Can. bari, a well, i.e. and kotu.

48.—Nelada, a valley; Can. nelada; Tam. nilam, a field; Heb. nahal, a valley.

49.—Ana, an elephant; Mal. ana; Can. ane; Tam. yanei.

50.—Kara, a bear; Tam. and Can. karadi; Pers. ﮐ ر ی kari, fierce, impetuous; Brahui kharma, a wolf; Mar. करडा karada, coarse hair.

51.—Ira, a buffalo; Can. yerme; Tam. irumei.

52.—Karu, young buffalo; Can. karu; Tam. kattra.

53.—Danam, cow; Can. danam; Sans. धेनु.

54.—Yelta, bullock; Tam. yeruttu; Can. yeltu; Armenian yesm.

55.—Nari, fox, jakal; Can. nari.

56.—Noi, dog; Tam. na, nai; Can. nai; Mong. nokoi, and nogai; Japan inu; Murmi* nagi.

57.—Kotti, cat; Engl. cat, kitten; Tam. katti, young of any animal; Arab ن ﮐ ﺘ kuttan, a biting animal; Hind. कुत्ता kutta, a dog; Mar. कुत्रा kutra, a dog.

58.—Poti, a hog; Tam. paṇçi; Tulu panji; Can. pandi; Samojedan paras; Lat. porcus; Tib. phag.

59.—Popo, a snake; Tam. pambu; Can. pavu; Concani Marathi, povo, a young snake.

60.—Moja, moji; fog; Tam. Can., Tel. manju; Mal. manyu.

61.—Pa, a lake; Tam. paikei; Hind. pani, water; (Sans. पान drinking.)

62.—Tora, food; Mal. and Tam. choru, rice; Tibetan khoru, bread; Pers. ﺧ و ر khora, eating; Celtic torth, a loaf.

63.—Uli, an onion; Tam. Mal., and Can. the same.

64.—Adige, a cooking vessel; Can. adige; Tam. adu, to cook.

65.—Nadawadati, behaviour; Can. nadawadike.

V.—ADJECTIVES.

1.—Prita, friendly; Sans. प्रीत; also other Indian languages.

2.—Ket, bad; Can. kedu, and kettu.

3.—Wollodi, unwell; Mal. olla?

4.—Bavu, old; Tulu para and palaye; Gr. παλαιος; Mar. बाळ

* The Murmis are a Himalayan tribe.

a hobgoblin (considered as an old man.)

5.—Busa, buta, new; Can. posa; Tam. putu.

6.—Nija, true; Sans. निज.

VI.—PRONOUNS.

1.—An, I; Tul. and ancient Tam. yan; mod. Tam. nan; Can. nanu; Mal. ngan; Tibetan nga; Heb. *ani*; Chaldean and Arabic ﺎﻧ ana.

2.—Ni, thou; Tam. ni; Tulu i; Brahui ni, Mingrelian zi; Chinese zen.

3.—Ata, ita, that; Can. atanu, itanu; Lat. iste, ista; Marathi to, ti; Brahui ed; Tibetan de; Sans. एतद् this.

4.—Yarizon, who; Can. yaru; Tam. ar.

DECLINATION OF AN, I.

Gen.; nana, or yana; Can. and Brah. nana; Tib. nyayi,

Dat.; nanka, or yenka; Can. nange; Tam. yenakku; Tulu yenku.

Instrum.; nanata, yenata; Tam. yenodu.

Accus.; yenama; Can. nannannu.

Am, we; Tam. nam; Can. naw; Mar. amhi; Brah. nan.

Nam, you; Tam. nir; Can. nivu; Brah. num.

Atam, they; Tam. atangel; Can. atangalu.

VII.—CONJUGATION OF YEPPENO, TO BE.

PRESENT TENSE.

	TODA.	CANARESE.	TAMIL.	TULU.
Sing. 1	Isken,	iruttene,	irukkiren,	ippuve,
2	Yetten,	irutti,*	irukkeral,	ippuva,
3	Yetatti, Yettaji,	iruttene,	irukkeran,	ippuve,
Plur. 1	Yetapemi,	irutteve,	irukkirem,	ippuve,
2	Yetapini, Yetappi,	irruttire,	irukkirir,	ippuvar,
3	Yettari,	iruttare,	irukkirar,	ippuver.

CAST TENSE.

Sing. 1	Yetten,	idde,	iruntan,	itte,
2	Yetti,	iddi,	iruntı,	itta,
3	Yetata,	idda,	iruntan,	itte,
1	Yetem,	iddevu,	iruntom,	itto,
2	Yeter,	iddiri,	iruntir,	ittar,
3	Yetaji,	iddaru,	iruntar,	itter,

* *Brahui* ares, thou art; areri, ye are

Perfect Tense.—Yettateneuk, I have been.

Future Tense.—Yettappeni, I should be.

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1. Ulpeni, I am; 2 ulpia, thou art; 3 udi, it is.

N. B.—This is a second form of the verb *to be*, in all the southern languages, just as in Turkish the roots Im and Ol assist each other in the substantive verb.

VIII.—LIST OF VERBS.

1.—Asanka, (impersonal) it has become; Can. aitu; Tam. ai; Tulu andu.

2.—Yelta, to say; Can. annu, ennu; Tam. *e*νpu. yelten, I say, yeltita, something said; Can. heliddu.

3.—Noda, see thou; Can. nodu; Tam. no-kiratu.

4.—Ankera, to sit down; Tam. unakkar.

5.—Arpeni, I know; Can. ariutteni; Tam. arik kiren; Tulu arpe. Arste, having known, Can. and Tam. aritu; Pers. ارواند arwand, proof.

6.—Bara, to write; Can. bareyu; Tam. varei.

7.—Wokha, go, ada wokha, thither go; Can. alli hogu; Tam. po; Engl. walk; Arab. وشن waksh, motion.—Poici, it is gone; Can. hoitu; Mal. poisi; vulg. Tam. pochchi. Pokem, let us go.

8.—Wo, come; ida wo, here come; Can. illi ba; Tam. va; Hind. idhar ao; Heb. *bo;* Bodaji, boji, he came; Can. bandanu; Tulu batte, Gr. βαινω, to go.

9.—Yerria, to grind; Can. arigu; Tam. arei; Arab يرّ yarra, hard smooth (stone)

10.—Pekidi, to be down; Tam. padu-kiratu.

11.—Geppini, make you; anageine, not made; Can. geiu, and Tam. jeyu, to make; Gr. τευχω.

12.—Tikaji, found; Can. tikku; and sikku to find; Hind. and Mar. thikan lagana, to find; Arab ثقف thakf, finding.

13.—Dippeni, to sneeze; Tam. tumpal.

14.—Pendakken, I hear; Tel. vintunanu.

15.—Tetvo, bring; probably tegadu ba of the Canarese, usually tegadu kondуba, having acquired come. This is the form of phraseology for bring used in Tamil, Hindostani, and all the Indian langua-

ges, and even in the language of Tibet. Tamil Kondu va ; Hind. lekar ao ; Tib. khur shog.

16.—Tuvin, to spit out ; Tam. tuppa. Kiratu. Mar. थुकणे thukane ; Sans. थुथु imitative particle.

17.—Phudu, let go ; Tulu budu ; Can. bidu ; Tam. vidu ; Hind. and Mar. बिदाद, sending away; Arab. ﺑﺪﻉ, parting.

18.—Madi, to make, Can. madu ; Tulu malpu ; Engl. made ; Tib. byed-pa.

19.—Udapini, I drink : udappini, I drank. Can. and Tam. kudiu, to drink.—Uduja, hast thou drunk : Can. kudya.

20.—Tina, to eat ; Can. tinnu.

21.—Palta, to stick, to lay hold of ; Can. pattu : Tam. and Mal. pattruka, or pappu.

22.—Yerpeja, thou hast washed ; Can. yerapu, to wash.

23.—Mechitti ; to cover ; Can. muchehu ; Tam. mudu ; Lat. amictus.

24.—Nasλa, to walk ; Can. and Tam. nada, nadia.

25.—Buλa, to strike ; Can. badi, bodi.

26.—Badaka, to live ; Can. baduku.

27.—Keda podagλ, to be destroyed ; Can. kettu hogu, (pogu) from ketto—bad, and hoga or poga,—to go.

28.—Duru, to burn ; Can. uriu ; Lat. uro ; Affg. wur, fire ; Kurdish ur ; and Heb. ur, fire.

29.—Apkija, hast thou cut.—Kei apd vodaji, (lit. hand cut not-must) you must not cut your hand ; Tam. apu, to cut ; Tulu bodiji, you must not ; Can beda ; Tam. venam.

30.—Tirijya, hast thou finished ; Can. tiridya.

31.—Keva, to sit ; Can. kudru ; Tam. kuppu.

32.—Vorga, to sleep ; Tam. urakkam ; Mal. orakkum : perhaps Can. yeragu, to bow, lie down.

33.—Tigelti, it is sweet ; Can. shi ; Mal. and Tam. ti ; and Tel. tipu, sweet.

34.—Pulajti, it is acid ; Can. and Tam. puli, sour.

35.—Muri yeda, to offer up a petition ; Can. more idu.

36.—Bisu, to lose ; Mal. venunnu, a thing lost ; Can. bisadu, bisu, to lose.

37.—Bippi, hast thou thrown ; (a kind of cawsal from Can. bilu to fall.)

38.—Poyom, poλu, to beat ; Can. po*d*eyu : Tam. pu*d*eikka.

Phrases.—Kel piyestom, let us speak, also arpedom.—The first seems the causal of kel, to hear *i. e.* let us make ourselves heard. The second, the causal of ari, to know ; i. e. let us make ourselves known.

Bisla gayodi, the sun shines. Neλe gasti, the moon shines.

Atam baskema ye*d*umma, they have said they will come ; baskema, futwr of the verb to come ; Can. baru ; Tulu barρem. Ye*d*umma, they have said, connected perhaps with Can. and Tam. eνρu to say.

Boddia, art thou come ? Can. bandia ; Tulu battia.

Atam yen e*d*a poiskka ; lit. they what having said went ? i. e. what did they say before they left ?—Yen, what is ? Can. yenu ; Tam. yennan.

Attanagei, so make it.

De udi gasji, God has made existant, De is the Sans. देव used throughout India. Udi. Can. un*t*u ; Tulu. and Tam. undu, a participle from ul, to be ; gasje, past tense of gei, to make.

Kelodisuppi, he has not asked : Can. Tam. Kela, to ask.

PARTICLES.

1.—Ani, now ; Can. ani, day ; Hind. abhi, now.

2.—Yel, where : Can. yelli.

3.—Inka, inkasa, here ; Tam. inku : Mar. ika*d*e.

4.—Irri, hither ; Can. illi ; Hind. idhar ; Tib, hadir.

5.—Inna, what ; Can. yenu ; Tam. yenna.

6.—An, thither ; Can. allige.

7.—In, hither ; Can. illige.

8.—Yer, yerjan. inside ; Mal. iρa ; Tam. idei, within ; Tib. nangan.

9.—Terige, again ; Can. tirugi.

10.—Bek, behind ; Mal. veiyuka ; Tam. veiλkal, stay behind ; Engl. back ; Pers. pesh.

11.—Imara, this side ; Can. i merege. } *Tam.* marunga, side.
12.—Amara, that side ; Can. a merege. }

13.—Madu*k*a, before ; Can, munde ; Tam. muduka. [Sans. प्रमुख]

14.—Ka*d*aga, near to ; Can. ka*d*ege ; Tam. kadei extremity ; Mar.

कड, near ; Tel. ikkade, this way ; akkade, that way ; [Sans. कट the side.]

15.—Atonon, so much ; Can. ashtu ; Tulu. ata ; Tam. attanei ; Hind. itana ; Mar. itake: Mal. tona, much.

16.—Yetatom, how much ; Can. yeshtu; Tulu yeta ; Tam. yetane : Tib. Chitsam,

17.—Ber, quick ; Can. bega : Sans, वेग

18.—Yava khalma, always ; Can. yavagalu.

19.—Yelolma, all : Tam. yellarum : Can. yellaru : Georgian qwelani : Engl. whole.

20.—Ita yeda, to-day ; Can. indu ; Tam. inpu ; Tib. dering.

21.—Pedaka, to-morrow ; Tel. repatiki.

22.—Berner, after to-morrow ; Can. bere, another, and Tam. meram, time. Mar. पर्वा purva, day after to-morrow ; Hind. parso.

23.—Abherner, day after to-morrow.

24.—Muner, before yesterday : Can. monne, from Can. munde, or, Tam. mun, before ; Tib. madang, yesterday.

25.—Ammuner the day before yesterday.

ART. IV.—*Translation, from the Persian, of the Kissah-i-Sanján; or History of the Arrival and Settlement of the Pársís in India. By Lieutenant* E. B. EASTWICK. *With a few Annotations by the Rev.* JOHN WILSON, D. D., *President of the Society.*

I have given a brief summary of the contents of the Kissah-i-Sanjan in the preface to a Sermon entitled "The Doctrine of Jehovah addressed to the Pársìs," published in 1839 ; but as the document is the most important of the very meagre accounts possessed by the Pársìs of the settlement of their forefathers in this country, I lately begged my friend Mr. Eastwick, who has just been admitted a member of our Society, to render the whole into English. This he has most readily done, and that with an accuracy and ability which may lead us to desire many similar contributions from his pen. I have added a few notes to his translation, which I have marked with the letter W. The Zand type here used, is from a fount lately prepared by the American Mission Press.

J. W.

In the name of God the Merciful and Beneficent!

Praise* be to the name of the God of Wisdom.
My soul unceasingly repeats His praises,
Night and day I offer to Him thanksgivings,
For my soul is made joyful by His praise.
In season and out of season I speak not but of Him;
He who appears to the world, Lord of the East.†
Powerful is He, and mighty everlastingly:
The eye of His creature is through Him filled with light.
He is the universal refuge and protector,
He is the merciful, and the forgiver of sins.
He hearkens ever to those who cry to Him.
He shews the way of justice and faith to the wise.
Cherisher of the poor and support of the world is He;
He bestows pardon and blessings on sinful man.
He is our eternal guide;
Friend of our secret hours and remover of our difficulties.
In thee, O God! is perfect power:
Thou art the King, and thy empire finds no decay.
Thou art the Lord of Lords!
Wonderful, fearless, incomparable!
From clay didst thou form man by thy power,
And infuse into him joy and happiness.
Thou dost convey the seed into the womb,
And dost impress the water with form:
Thou givest the seed form and body,
And conveyest to it the faculty of sight.
Thou hast given the manifest power of speech,
And hast bestowed on man an invisible essence:
Thou hast imparted to his eyes the power of seeing,
And to his ears the faculty of hearing.
Thou hast given him a tongue to utter words
That he may move it in the repetition of thy name.
Thou hast given him the power of smelling perfumes,
And feet that he may stand withal.

* In the introduction to most modern Pársí MSS. and publications, the praises of God are recited, as in this instance, much in the form adopted by Musalmán writers. The descriptions of the Deity thus given, far excel those contained in the Zand-Avastá.—W.

† خاوران شاه in the originial. خاور "The west; but often used by the poets for the east; and also for the Sun." *Richardson's Dictionary.* The allusion above is evidently to the Sun, which, it will be observed, the author of the Kissah-i-Sanjàn, makes synonymous with the Deity.—W.

Thou hast strung thirty-two pearls* in one necklace,
And hast given to us the power of taste.
So perfectly has the world been formed
That one could surrender life for the Artificer.
In the souls of lovers thou hast infused bitterness,
And hast given relief to their suffering and pleasure.
Thou hast formed the two worlds over Chaos,
And hast made man the ruler over creation.
Verily the Godhead beseemeth Thee!
Wisdom hath testified to thy works.
Wherever my tongue utters thy infinite praise,
It is exalted by thy thanksgivings.
My neck is bound with the cord of thy love:
Wherever it draws there I hasten.
I have no choice but to obey my Lord,
Since I am ever filled with the zeal of obedience.
Eternity is the attribute of God alone,
Since He is ever without equal.
Thou hast created the Universe:
By thy command the world was formed.
Man was formed by Thee of clay and sand,
And Thou didst confer on him the stewardship.
Thou art the unchangeable One!
And Thou dost render me assistance.
Thou hast nor equal nor compeer.
And all creation rose at Thy command.
Heaven and Earth were created by Thee,
And man was formed by Thy power.
Bahman has brought his soul to Thy Court;
In this world his heart is enlightened by Thee.
Fill thou his heart with the true faith
And free his soul from the bond of grief.
Keep him always in the faith,
And by Thy grace enlighten his soul.
I have no benefactor beside Thee
And my hope in both worlds rests on Thee.
O Thou merciful One! forgive my sin,
And my tongue shall repeat Thy praises.
Thou protectest my helpless life, and heapest blessings on thy creatures
To whom shall I turn if Thou repellest me?
Where shall I betake myself since there is none like Thee?
I am ashamed of the imperfection of my praise,
I have no part in this knowledge,
I come before Thee deprecatingly,
Since thy empire is eternal.

* The teeth!

Assist me, O Supporter of the world,
Since I am the humblest of Thy creatures.
I will have no point of adoration but Thy house.
What acceptable thing shall I offer to Thee?
In life I seek Thy aid,
Since this body will not accompany me hereafter:
At the last Thou wilt restore my body,
What is there dreadful then in death?
When my spirit shall go to Paradise,
I will keep Thy name on my lips.
When my spirit separates from the body
Send Thou an angel to me,
But an angel of the inhabitants of Heaven;
That my soul may be enlightened thereby.
Those sins of which I am ignorant
Do Thou, out of Thy mercy, forgive.
What excuse shall the aged Bahman offer,
Since he has failed greatly in obedience?
But forgive his sins, and free
His soul from secret fears.
Accept Thou the words of my prayer,—mercies
Since I have experienced from Thee diverse.
O Lord thou knowest my secret thoughts,
Why drivest Thou me vainly to and fro!
My salvation in this world is from Thee,
Why should I seek the favour of others?
My youth is gone, and my old age arrived:
The cypress tree of my life approaches Paradise.
The aged Bahman is the most abject of the lowly:
Aid Thou me, and support me always.
Thou art my God in both worlds:
I am weak and powerless, but Thou art my stay.
Wash the sleep of forgetfulness, O God, from my eyes,
And free me from iniquity.
According to the manner of my sinfulness,
Judge Thou me not, O good Lord!
Of Adam only, sin is produced*:

* تمی آ ـ زادم جز گذا هے literally, "from Adam nothing but sin hath come." The doctrine here taught is evidently derived from the Jewish scriptures, probably through the medium of the Musalmán writers, whose style is imitated in this introduction. It is the dogma of the Zand-Avastá, that neither original depravity, nor sin, attaches to man at his birth. Thus we have:

ـــ مس ىدطاك ولىدع . هاىدوچ ىدوىد . ىدوىد ىچ . ىك ىرطاع هاىد . جاىد ىوىد ىوىد مس ىد . ىوىد
مس طاك ولىدع . كىداىد ىطاك ىوىد مىاىد . مس ىد . ىدمس ىد . هاىد ك ىدوىد ىدىوىد .

Shew me how to believe in Thee.
In Thy Court I lift up my cry,
That Thou wilt not write my name among sinners.
If Thou wilt bless thy servant
I shall be exalted in both worlds.
I had begun to reflect regarding Thee,
And again I had renewed the consideration:
I beseech Thee, O giver of prayers,
That Thou wilt turn on me the face of thy mercy!

The Tale of the Arrival of the Believers in the True Faith in Hindustán from Khorásán.

Hear now a wondrous tale
Recited by the Mobeds and the faithful!
Should I speak, the relation would be impossible:
Should I write it, no paper would contain it,
Yet will I endeavour to repeat somewhat thereof:
If the words of it be a hundred I will utter at least one.
I have heard from a wise Dastúr,
From one ever famed for goodness,
Who had so read the Zandavastá
That he could repel the followers of Ahriman.
The eyes of the men of his city were fixed on him,
For the faith was ever enlightened by him.
In these times his order was over all:
He it was who arranged the affairs of the faith.
Whoever enquired of him in matters of religion,
In obeying him executed what was due thereto.
In the city which he inhabited
He rejoiced with his heart and soul to impart instruction.
He related this tale according to the tradition of the faithful,
And recited the secret legends of the true believers.
One day he acquainted me with this story:
He pierced the pearl of intelligence excellently.*

yaozhdáo mashyái aipi záthem, ýahistá hā yaozhdāo Zarathustra, yā daéna Māzdayaçnis—"For the man *pure upon birth*, O pure Zoraster, [is] this excellent Mázdayaçní religion." *Vandidad, fargard* V. This doctrine is defended by Dosabhái, the author of the Tálim-i-Zartusht, lately published under the auspices of the Pársi Panchàyat. It is opposed, however, by Aspándiárjì Frámjì, another contraversialist, who has come forward in defence of the Zoroastrian faith.—W.

* An overstrained metaphor, for accomplishing any new work.—E.

He it was who gave me the relation:
And for that, may good abide with him everlastingly.
As he made the relation to me, so I repeat it:
I recite the legends of the faithful.
In the days when reigned Gushtasp,
The heavenly Zartusht revealed the faith.
In the Wasta* he prophesied what would happen.
He said—An oppressive King will rise among you;
Three times will the true faith be broken;
Thrice will it be trampled on and overthrown:
The name of that Shah shall be 'Situmgar'†:
Through him the faithful shall be brought to despair.
Be attentive, for I speak of what concerns the faith.
'Twas thus the faithful were brought low:
Sikandar Sháh appeared in the latter days;
He burned the books of the true revelation.‡
For three hundred years was the faith brought low,
For that time were the faithful oppressed:
Then for many years the faith found protection.
When king Ardashír§ had assumed the sceptre,
Again the true faith was restored,
And its excellence confessed through the world.
The guide sent by God was Ardai Viraf,
Sent from Heaven and possessed of all excellence;
And after that the inhabitants of Heaven
Again broke through this ordination—
Again they interrupted the good faith.
On all sides an evil report of the faith arose.
After a time when arose the king Sháhpor,
He again rendered the faith illustrious.

* Or, Avastà.

† Or Sikandar (Alexander.)

‡ According to the general traditions of both the Musalmáns and Pársìs, Alexander the Great and his successors destroyed all the books of the Persian religion on which they could lay their hands. Edal Dāru, the present chief-priest, of the Rasamìs, the larger sect of the Pārsìs, denies the fact. (See *Maujazāt-i-Zartusht*, pp. 21—23). His opinion he supports by making an indefinite reference to the *Farhād-Nāmah*, a work which, he says, was composed by a Mobad in the days of Ardeshir Bábegán, about 450 years posterior to the death of Alexander; to the *Dabistān*; and to the *Shāristān*, a work somewhat similar to the *Dabistān*, composed in the reign of the emperor Akhbār,—the author of which declares that the ghost of Alexander himself appeared to him in a dream and declared that he was innocent of the crime laid to his charge. Such conclusive testimony as that last mentioned, it is of no use to impugn.—W.

§ Ardeshir Bábegán.

When the faithful Azarbad Mahrasfand,
Girt up his loins for the sake of the good faith,
He formed brass of seven materials,
And poured thereof upon his body.
He removed all the difficulties of the faithful,
And again restored its former splendour.
From Shák Sháhpur to Yezdajird,
The faith retained its dignity and honor.
Then the days foretold by Zartusht arrived,
And men sought in vain for the true faith.
When a thousand years from the time of Zartusht had elapsed
The star of the true faith reached its zenith.
When the kingdom went from Shah Yazdajird,
And the enemy of the faith had seized his throne,
Then the power of man was broken:
Alas! that land of the faith was laid desolate,
Then were all those dispersed
Who had fixed their hearts on the Zand and Pazand:
Then the faithful and their Dasturs altogether
Concealed themselves on account of their faith.
Their abodes and residence, their gardens, halls and palaces,
All these they abandoned on account of the faith.
A hundred years they abode in the mountains.
When their state had arrived at this,
At last for the faith of his people,
A pious man gave this counsel:
He said to his friends—Behold! in this place also
To tarry is difficult from fear of the enemies of the faith.
The faithful with their Dasturs to a man,
Then departed to the city of Hurmaz.*
After they had sojourned in that land fifteen years,
They began to experience oppression from the enemies of the faith.
There was among them a learned Dastur
Who was skilful in reading the stars,:
He examined the ancient tablets and saw
That destruction was approaching (if they tarried there):
He saw that it was right to leave that land—
That it behoved them now to depart,
Otherwise they would fall into the snare;
Their understanding would be vain, and their efforts futile.
They resolved it would be better to fly from the wicked Dews
And betake themselves to the confines of Hind.
From fear of death, and for their faith, they all
Betook themselves to Hindustan.
When they had brought down their ships to the Ocean

* The island of Ormus.—W.

They raised their sails aloft :
Their wives and children they placed in the vessel :
Swiftly they sailed towards Hind.
When the ships arrived thereat,
They dropped anchor at Dib :*
They disembarked and fixed on a spot there :
There at length they took up their residence.
The faithful remained there nineteen years :
At last the astrologers made augury.
An aged Dastur saw in the tablets of the stars
What he thus related to his enlightened friends :—
From this place it behoves us to depart
That we may seek out another abode !†
All rejoiced at his word,
And they sailed swiftly towards Gujarát.
When they arrived in the Ocean
The calamity of a tempest fell upon them.
All the Priests of the faith were filled with fear :
They remained in that stormy sea confused with dread.
They pressed down their faces in prayer :
They stood up and wept piteously.
They said—O wise God ! aid us in this jeopardy :
Rescue us this once from the impending woe !
O Glorious Bahram‡ come to our assistance,
Remove this difficulty and make us glad.
Depending on Thy goodness we fear not this storm,
We tremble not in our souls thereat :
Thou art the Hearer of those who cry to Thee :
Shew Thou the right path to the wanderers from the way.

* Or Diva, an island a little to the south-west of the peninsula of Kátiáwár.—W.

† "A writer professing to follow the authority of [this passage of] the Kissah-i-Sanjān," says Mr. Romer, in his Illustrations of the Zand and Pahlivi Languages," (innocent, I am bound to add, of the egregious anachronism), gravely informs his Pārsi readers, that it was the persecution of the *Portuguese* which compelled their ancestors to quit Diu, an event, we have seen, that occurred about the year of grace 717." *Journal of the Royal Asiatic Society*, No. viii, p. 360. The writer to whom Mr. Romer here refers, is probably the late dastur Aspandiārji Kāmdinji of Baroch, the author of the *Kadim Tārikh Pārshioni Kasar*. He says of the Pārsis at Diva, that ફીરંગીઓના અમલ તળે રહ્યા પછી દીનનો આરડા થઈ ગયો. "On account of the government of the Firangis, the practice of religion could not proceed."—W.

‡ One of the Pārsi Izads or angels.—W.

If we escape from this sea to the shores of Hind,
And arrive there with joy and gladness,
We will kindle on high the flame sacred to Behram,*
The Rescuer from danger and Preserver from peril:
We agree to do this in honor of God,
For there is none to befriend us beside Him!
By the blessing of the glorious flame of Behram
They all escaped with gladness from that danger:
That moment their prayer was accepted,
And God in their need rendered them aid.
A gentle gale arose breathing heavenly light:
That stormy wind departed before it.
When the helmsman lifted up his voice
In praise of the holy God, and steered out of the whirlpool,
All the Dasturs and the faithful who were in the vessel
At once directed the ship into the clear sea.
Fate then ordained that thereafter
They all arrived at Sanjan.†
In that territory there was a good Raja
Who flourished there in righteousness.
His name was Jádí Ráná,‡
Who was liberal, wise and prudent.
A Dastur went before him with offerings,
Selected for his learning and understanding.
He blessed him and said, O Rai Rayan,
Grant us a place of abode in this thy city:

* The *A'tish-Behram*, or fire of Bahram, is found only in six of the temples of the Pārsīs of India. One of these temples is at *Udhwādā*, north of Daman; one, at Nausārì; two are in Bombay; and two in Surat. The *Atish Adarān*, (literally the fire-of-fires), the other so-called sacred fire worshipped by the Zoroastrians in this country, is to be found in most of the villages which they inhabit.

† It is from this place, the first at which the Pársís settled in India, that this historical tract receives its name—the *Kissah-i-Sanjān*. It is situated on a creek, anciently of the same name, about 24 miles south of Daman, and about 4 or 5 miles inland. In 1839, in company with the Rev. James Mitchell of Punā, I paid a visit to it, with the view of collecting any traditions respecting the Pársìs which might be afloat in its neighbourhood. It now contains only one or two Pársí dwellings. In the neighbouring village of Nárgol, probably a part of the original Sanjān, which was represented to us to be very extensive, there are still a considerable number of Pársìs. We could learn nothing from them, but the traditions embodied in this tract.—W.

‡ This is probably a corruption of the Hindù name Jayadeva. The prince was probably subordinate to the Rajput King of Chàmpaner, or perhaps Pattan, formerly the Hindù capital of Gujarát.—W.

We are poor, and have sought thy protection.
We have arrived in thy city and at thy abode.
We have arrived here by reason of our faith.
We have heard that in this place is one
Of virtuous acts, descended from the kingly Rayan,
Whose fame perpetually extends through Hind.
We hope to find refuge in thy city and land,
And that thou wouldst look favorably on us.
From what we heard of thee we rejoiced,
And auspiciously have we arrived in thy presence,
Now have we come to thy city,
And by our hopes in thee have escaped the wicked.
All the followers of that excellent Prince
Rejoiced in their hearts, and were glad at this discourse.
When the Prince beheld the faithful,
He was suddenly filled with fear:
His heart began to fear for his crown
Lest they should devastate his country.
The Rai was filled with apprehension at their dress:
He inquired of the Dastur their secret observances.
He said at length—O pious Dastur,
Tell me first the secret of your affairs.
What then is the nature of your faith?
What is it manifestly and in secret?
First let us know this faith of yours,
After that we will prepare your abode.
The next condition is, that in order to remain here
You abandon the language of your country—
That you give up the language of Irân
And acquire the language of Hind.
The next condition regards the dress of women,
Which must resemble that of the women of this land.
Fourthly, these weapons and this armour
Must be laid aside and discontinued.
Fifthly, when a son is married,
The marriage procession must be at night.
If these conditions are accepted by you,
Our city is open for your reception.
When the Dastur heard all these words from the Rai,
Being without resource he accepted the proposals.
Then the old Mobed thus addressed the Raja:
Hear, O illustrious Prince! what I relate of our faith:
Be not thou afraid of us,
No evil will result from our arrival here.
We will be friends to all Hindustan:
We will scatter the heads of thy enemies.
Know for a certainty that we worship Yezdan.

On account of our faith have we fled from the unbelievers:
We have abandoned all our possessions:
We have encountered difficulties in a long journey:
House, and land, and possessions we have at once abandoned.
O Prince of excellent fortune!
We are the poor descendants of Jamshìd:
We reverence the moon and the sun:
Three other things we hold in estimation—
The cow,* water and fire.

* This reverence for the cow seems to have been insinuated to please the Hindú Ràjá.—E.—This is an opinion not uncommonly entertained by our countrymen. The cow or bull, however, would appear to be essentially an object of reverence according to the Pársí religion. It is several times alluded to as such in the Zand-Avastá. Thus, the twenty-first fargard of the Vandidàd opens with the words *nemeçe-tê Gāoçpenta*, "Salutation to the exalted Bull." In this section, there are very curious notices of the supposed influence of the Bull in removing evils, and promoting the fertility of the earth. There are probably, in connexion with these matters, some obscure references to the constellation Taurus.

In the Maujazât-i-Zartusht of Edal Dáru, the learned chief-priest of the Rasamís, to which I have already alluded, a work dedicated to that liberal Pársí Sir Jamsetjee Jeejeebhoy, and said to be published at his expense,—there occurs a passage of which the following is a translation:—"There is a consecrated white bull called by us *Warshio*..... which they keep in readiness for some time. Afterwards, two careful Mobeds having cleansed and consecrated, and dried, according to the laws of religion two brazen pots, collect together into the first the urine of the white bullock, and into the other *ava*, or pure water, and they keep the mouth of the vessels covered. Afterwards these two Mobeds having taken them to the place for performing the Izashnè, and the half of the night having passed, they commence the recitation of the Vandidád, Izashnè, and Vispard [which together form the larger liturgy of the Pàrsís]. At the dawn, when these two Mobeds cease from the consecration of the urine, they tie the mouth of the vessels with a clean cloth, and keep them separately in a pure place. Afterwards, if we keep this pure urine and pure water in a bottle or in a clean vessel for the space of ten years, then they will remain as they are without smell and without injury; while if a Jud-dín [person of another faith] were to keep the same urine in a vessel, it would be injured in ten or fifteen days, and an evil odour would proceed from it, and if water were kept for many days, insects would be produced in it. Wherefore, observe, with the eye of wisdom, that as water, in ten or twelve days, becomes bad, so this urine and water, from the blessing of the ceremonies of our religion, is not injured for the space of ten years, but remains in its original state. It ought to be certainly known that all this good-

We worship* fire and water :
Also the cow, the sun and moon.
Whatever God has created in the world
We pray to, for He has selected them.
This belt, composed of seventy-two threads,†
We bind on with the solemnity of vows.
Our wives when they are in their courses
Look not on the sun, or water, or on the moon :
From fire and water they remain at a distance,
Since those things are of the essence of light.
From all things they carefully abstain
In the light of day and the darkness of night :
They abstain till their courses are completed.
When they have purified themselves they look on fire and the sun.
Moreover the woman who bears a son
Must observe restriction forty days—
The same restriction as a woman in her courses,
And she must remain retired and in seclusion.
When a women bears her son before her time is fulfilled,

ness is owing to our holy Zand-Avastá. It ought to be known also, that this circumstance is mentioned in the first book of the *Wajarkard*."

According to the Vandidàd, religious ablutions are generally to be performed with cow's urine. Many atonements are also made by potations of this beverage.—W.

* پرستش میکنیم in the original Persian. Dr. Hyde says that the Pársis of India never allow their adoration of the elements to be characterized as *parastish*. The text of the Kissah-i-Sanján in this place, is one of some hundred testimonies which could be adduced to evince his mistake. A considerable number of them, along with many illustrations of their warrant by the Zand of the Vandidád and liturgies, I have brought forward in a work now in the press, entitled "The Parsi Religion as contained in the Zand-avastá, and propounded and depended by the Zorastrians of India and Persia, unfolded, refuted, and contrasted with Christianity."

† The *Kustì*, or sacred cincture by which the loins are girt. I have never heard any rational explanation of it as a symbol from the Pársis. The same remark is applicable to the *Sadra*, or sacred muslin shirt. The form and texture of the latter, however, evidently show that it is intended to be the representative of a *Coat of Mail*. The *Sadra* and *Kusti* together, are the panoply in which the Pársis believe that they can successfully resist the assaults of Abriman, the evil Principle. Edal Dáru, in his Manjazat-i-Zurtusht, says "that the *Sadra* and *Kusti* preserve the soul from the calamities accruing from Abriman;" that the "souls of dead children," are prevented by them "from becoming devils, *Khavis*, and *Jins*," "while many of the souls of the Jud-dins become devils, *Khavis* and *Jins*." pp. 4, 8.—W.

Or when a dead child is born to her,
She is not permitted to go abroad or move out,
Nor is she allowed to converse with any one.
That woman must observe a strict abstinence—
For forty-one days she must abide therein!
Thus whatever were their observances and rites,
The same did that Dastur recite to the Raja.*
When the mysteries of the faith were unfolded,
And the pearl of intelligence had been well pierced:
When the Hind Raja had heard the words of the Dastur,
And his heart had been filled therewith;
Then did that good Prince command them
That they should abide in his land.
He ordered that their men of rank and age,
Of good disposition and wise of counsel,
Should examine the land minutely,
And when they found a vacant spot, should inform the Mobed thereof.
A place in the desert was fixed upon:
It was a pleasant spot, and there they fixed their abode.
They found that spot acceptable,
And they raised a city where had been a desert:
It was then but forest land and uncultivated:
When they, with their wives and old men, disembarked.
When the Dastur saw the soil was good
He selected the place for their residence.
The Dastur named that spot Sanjan,
And it became populous as the land of Iran.
There they sojourned with repose and happiness:
Every one betook himself to his own pursuits.
One day when they had business with the Raja
They all went before him glad of heart.
The Dastur said to him—O son of Princes!
You have given us an abode in this region.
It is now our desire to place in this land of Hind
The sacred fire of Bahram.
It is necessary to clear the land for three farsakhas
That the affair may be properly conducted.
Let no stranger approach the spot:
None but the wise and faithful may draw near.
There let no enemy of the faith appear,
Then the worship of the sacred flame will be rightly observed;

* The Pársís have summed up the information given to the Rájá in sixteen Sanskrit Shlokas, which are commonly circulated in a somewhat corrupted form in the Gujarátí character. The substance of them, I have given in "The Doctrine of Jehovah addressed to the Pársís."—W.

Lest any one should lift his voice therein,
And a hindrance should occur in our worship.
The Rai replied—I grant permission :
I am free from this request as I comply with it ;
I agree to it from my heart,
For I desire such a shrine to be reared during my life.
What is better, O wise men,
Than at once to commence the undertaking.
At the same time the Rai gave the order,
He gave up a place to the pious Dastur :
At the same time the Prince, that Hindu Raja,
Cleared the ground in every direction :
To the distance of three farsangs he removed the enemies of the faith :
Within that space none remained but the faithful.
No one remained there to the distance of three farsangs,
None except the men of wisdom.
Round about were placed the vessels used by the Dasturs,
Shining brightly like the sun.
Night and day watches remained there.
Thus by the order of Yazdán was the affair ordered.
In that time all were wise,
Every one was skilled in the affairs of religion.
On the appointed days and months they held solemn feastings—
They prayed and gave abundant donations.
The faithful were delighted in their own affairs,
And thus firmly established their faith.
The Prince also, Jadi Rana himself,
Sent abundant offerings of every description.
In those times all the government
Was transacted by the hands of the faithful.
All their affairs were prosperous,
Inasmuch as they had brought with them the tools and skill of Khurásán.
Several families also of the Dasturs of the faithful,
Of righteous behaviour had arrived there.
With them also were several alchymists,
To whom success was given by the favour of God.
Many implements and much furniture they had brought with them,
And they kindled the sacred fire according to the rights of the faith.
As the faith prescribes, did those ancient Dasturs
Place three sacred fires full of exceeding light.
In those times they were learned in the faith,
And executed the matters of religion wisely.
In these times God only knows what is the faith : *
However one thing is certain, that the faith must be observed.
In that land all the faithful and their Dasturs

* I would recommend this line to the consideration of the Pársís.—E.

Held a festival, solemn, and exhilarating with wine.
Thus three hundred years more or less passed away,
And many men flourished there whose number is uncertain.
The faithful were dispersed through Hindustán ;
Wherever they pleased they selected their abodes.
Some went with their whole property to Nausari ;
They removed there pleasantly and fortunately :
Some turned their faces to Bánkanir :
Others betook themselves to Baroch.
Some went towards Baryao :
Every one sought a different abode.
Some arrived at the city of Anklisar.
Some assembled themselves in Cambayet.*
Every one found repose in a different direction.
Much happiness and property they enjoyed,
And thus they passed two hundred years.
In that time in the city of Sanjan,
Those families of the Dasturs which had remained,
On them fell the decree of fate—
I know not what became of them.
There was a Dastur young in goodness,
And possessed of the talent of eloquence—
The name of that Dastur was Khushmast,—
Whose actions were always those of righteousness ;
The name of his son was Khujistah,
Who was obedient and dutiful to his wish.
It was always his duty to perform the Yazish,†
Since he was always vers'd in the rites and in the Báj.‡
He was also well skilled in the Yazish,
And remained constant at the Arwisgah.‖
That holy person was held in high repute,
And may he rejoice in the delights of Paradise !
In this manner seven hundred years had elapsed,
When heaven became unpropitious in the following manner :
Suddenly the world became narrow to him,
And fortune every where oppressed him.
After certain years in the lapse of time
The Shah heard of the Rai of Sanjan.

All these lines are very obscure, and appear entirely unconnected.

* All the places here mentioned are easily recognized on the map of Gujarát.—W.

† يسن *Yaçna*, in Zand, the sacrificial rite, corresponding with the Sanskrit यज्ञ *Yajna*, sacrifice—W.

‡ The "muttering" at meals.—W.

‖ The board on which the Párśis place the vessels they use in their religious ceremonies.—E.

After five hundred years had elapsed from the arrival of the faithful in Hinde,
Islam was introduced into Champanir.
A good Shah was born with fortunate omens:
In that City he was enthroned.
His name was called Sultan Mahmud:*
His subjects called him the shadow of God.
When after certain years he was informed
That there was a prince in the direction of Sanjan.
His vizier Banaz Khan said one day,
That thus hath the fortunate Shah ordered:
'Proceed with an army to Sanjan,
That the land may be brought under subjection.'
At the order of the Shah Sultan Mahmud
Forth came the warriors like the spreading of smoke,
All his army clothed in armour,
The Eagle unclosed its pinions.
When Alaf Khan had moved his army thence,
He advanced on the populous Sanjan.
News was brought to the Hindu Prince of that host:
He was told that from every quarter his foes were assembled.
There were two thousand chosen horsemen
Selected from that numerous host by their noble leader.
When the Raja heard of these tidings he was dismayed.
After a time he again recovered his senses.
He then called all the Mobads to his presence—
All the faithful and the Hérbuds.
That good prince said to them—
What counsel give ye my faithful friends?
My ancestors exalted you;
They lavished favours upon your people:
In this my difficulty it behoves you to exert yourself,
And to lead the way in battle.
If ye recollect the benefits conferred by my ancestors,
Do not refrain from shewing your gratitude.
Then the old Mobad, responded to him,
Fear not, O prince, on account of this army.
All of us, as long as our lives remain,
Will scatter the heads of thy foes by thousands.
Our custom in battle is known to all:
We give not way as long as our lives continue.
One man of us will never turn back,
Though a millstone were dashed on his head.
When the Prince heard his words,

* This is Mahmud Shah, surnamed Begada. The time referred to was about 1507, A. D.—W.

He bestowed on him a dress of honour of divers pieces.
In those times there were among the faithful
Many who were fit for war, both young and old;
They reckoned up the number of believers,
And fourteen hundred were entered on the roll.
Instantly the young men bound their saddles on their horses;
The horsemen stood armed in mail:
In that place the whole body of the faithful
Drew up their ranks before the Raja.
The dawn rose on the darkness of night,
And the lamps of the stars were concealed in the cave of gloom.*
And now when Alaf Khan with his horsemen
Put on their armour and descended to the plain,
They placed their embroidered saddles on their steeds;
They raised their banners on the backs of elephants;
They saddled their horses for the battle;
The plain was rendered narrow by reason of their elephants.
The leaders arrayed their troops;
On all sides they prepared the weapons of war.
When they had drawn up their squadrons on the plain,
They blew the brazen trumpets of war.
Thus was each army drawn up in array:
On one side the host of Islam, on the other that of Hind.
Day and night they were engaged in strife;
The speed of their horses through much labour grew slow.
The two leaders on either side like dragons,
Exerted themselves like leopards.
The world grew dark as pitch with clouds,
From which rained sword and javelin and arrow.
On either side many were slain:
Every where the dead lay in heaps;
None succoured them or came to their aid.
Such was the order of God regarding them.
Around through the hosts none were visible;
All had fallen in countless numbers.
Flight then arose among the army;
None recognised another therein.
That pious leader said to his friends—
"I see none of our Hindu friends around us.
(For the Hindus fled from the battle,
None but the faithful remained there.)
Now is the season of battle, O my friends!
Let us go into the contest like lions;

* This is perhaps intended metaphorically, for the hope the army of the faithful inspired.—E.

Let us make a simultaneous effort;
And let our swords and arrows drink the blood of the foe."
Who was the first of the faithful who entered the battle?
His name is related to have been Ardashir.
That instant did the celebrated Ardashir
Impel his rapid charger across the plain.
He leaped forward and suddenly penetrated the ranks of the enemy,
Grasping in his hand a steely spear.*
He stood on the plain with the javelin in his hand;
He girt on his mail, and bound on his sword.
First the arrows rained on all sides:
The armour of the warriors was rent in the battle.
The world-illumining sun was concealed:
Who could tell whether it was day or night!
The rays of day were obscured by dust,
Caused to rise where man struggled with man.
You would have thought the world was darkened with pitch,
In the midst of which the arrow points glittered like diamonds.
Of those who carried javelin and wielded mace,
But few remained of thousands.
Earth and sky were dark and obscured;
The ground was painted like a tulip with blood of chiefs.
Blood flowed in fountains from the bodies of the slain:
Heads were cloven in pieces with the sword.
Calamity overtook the lives of men:
Each moment death received its guests.
The heroes were clothed from head to foot in iron:
The bright blood shone like the sun.
On each side incessant flew the darts:
The dark blood dropped on the plain continuously.
The javelins quivered in the breast of Kaus,
The life of Tarau's was reached through his mail.
From the blows of the heroes none turned away:
Every weapon demanded blood.
The earth was plated with the iron shoes of the horses:
It flowed with blood up to the knee.
Three days and nights thus continued the battle,
That the hands and feet of those who fought waxed weary.
On all sides glittered the lightning of the sword:
Heads were scattered before the trenchant blades.
In that contest Islam was overthrown:
It was cast down in the battle with the Raizada.

* What can be in more execrable taste than this, to describe the warrior putting on his mail after acquainting us that he had entered the battle; that is the υστερον προτερον indeed!!—E.

Alaf Khan fled in the darkness of night:
He forgot both the road and order:
All his army were discomfited.
They fled from before the face of Ardashir:
In the battle many of his enemies were slain:
The issue of the contest was glorious.
All his women and his equipments
Fell together into the hands of Ardashir.
Again the two armies shouted for the battle:*
Earth was again filled with commotion
By the ringing of bells, and the blast of the trumpet:
Many heads were smitten with confusion.
Again Alaf Khan prepared for the fight:
The brazen drum was again in motion.†
The noble leader Ardashir
Again made his appearance in swift career.
He cried to that excellent Prince—
"They are a hundred warriors to our one:
Behold now our actions in this extremity,
Since their army has re-appeared in greater numbers than before,
We will either yield our lives or take that of our foes:
We prepare for the battle with this resolve:
In this fight may God befriend us,
Since he always removes our difficulties."
At these words those who heard were glad,
Many hearts were freed thereby from pain.
They then all put on their armour
And descended to fight with the Khan.
Then the illustrious Ardashir
Bound to his saddle the noose of war.
He entered the ranks like a lion:
On his waist was a sword of Hind, and a dart was in his hand.
Loudly he shouted—O ye fugitives,
Why are ye timorous in the day of battle!
Where now is your leader?
What is his employment and name?
The chief of the foes appeared and said: "I am he,
Who spills in one blow the blood of my enemies."
Beneath him was a steed named Sulak.
He came towards Ardashir swiftly:

* Here again the connection seems entirely lost, for we are not told how the army of Alaf Khan, so lately described as in utter rout, rallied and returned to the battle.—E.

† The original is—"The drum, like a hawk, began to fly"—than which I do not recollect ever to have met a more inappropriate simile.—E.

He came to oppose him grasping a javelin :
On all sides he glared like a furious lion.
He shouted once to Ardashir—
" Now, O noble foe, guard thine own,
For a combatant has come to fight with thee :
Now then display thy skill in war."
Ardashir shouted to him in reply—
" Thy equal in fight has come against thee also."
They both fared in the battle like lions :
They were satiated with the blood of each other.
At last Ardashir obtained the victory :
He cast him down from the back of Sulak :
He cast his noose and drew him towards him :
He dismounted from his steed and cut off his head.
When Alaf Khan beheld him slain,
His heart was filled with grief.
He gave orders that the men of Fars and the Hindu Prince
Should be slain and not permitted to live.
His army followed him full of vengeance.
He spurred on his steed to the battle.
The clashing of the swords arose incessantly :
Blood was poured in streams on the earth.
When the two armies joined in battle,
Blood poured from their bodies like the sea :
Waves of blood arose.
On all sides was the destruction of men :
No place remained which could contain an ant.
But what can any one devise without the command of God ?
Then approached the termination of the life of Ardashir,
He fell, and the end of his days arrived.
A dart reached his waist,
And transfixed him suddenly.
His body was weakened with wounds,
For a fountain of blood spouted from each limb.
Ardashir fell headlong from his saddle :
His army became confused when they lost their leader.
Alas ! for that noble chief !
Destiny at last cast him down.
When evil fortune arises, in that season
The hard stone becomes soft as lead.
Had he fought with ten times greater vigour,
What could it avail him since his destiny was adverse ?
On both sides many warriors were slain—
The noble, the illustrious and the good.
Then fell too the blameless Hindu Prince :

The army was turned to disarray.
Alas! for that excellent Prince:
He fell, and his city became desolate.
At last the army of the faithful was scattered.
There is a mountain in Hindustan named Bharut;
Many fled thereto from terror of death.
The order of God is irrevocable.
Twelve successive years elapsed
During which the royal fire itself was neglected.
Then after a period by the command of God
They set forward, themselves and their families:
They carried with them the sacred flame of Bahram:
They proceeded in the direction of Bansadah.
When the people of Bansadah heard thereof,
They came forward to meet them courteously.
They arrived there with three hundred horsemen,
And with many honorable men:
They led them into the city with much respect.
Thus was their grief alleviated.
The city of Bansadah rejoiced at their arrival,
And thus were they supported.
Thereafter from that place the descendants of the faithful,
From every clime where believers were to be found,
Proceeded for the service of the Shah
Both women and men, young and old.*
As in former times in the celebrated Sanjan,
Every tribe of believers flourished
In the same manner afterwards in Bansadah:
They arrived from all quarters with abundance of wealth.
After this when fourteen years had elapsed,
The Heavens became prosperous to them.
In that time one among the faithful arose:
There was none to equal him in those days.
He appeared there, and exhibited righteousness:
Many miracles were wrought by him.
Dhewud† was his name, and he resembled the blessing of marriage,
For he brought encouragement to the faithful.
In the latter times that man of excellent qualities
Renewed and extended the true faith:
If any one had not the Kusti or the Sadra,
He himself contributed the sums necessary to be expended—
Well did he arrange the affairs of the faith:
None ever came to him under affliction,

* The whole of this passage is very obscure, and appears corrupt.

† This appears to be a mistake; for, as below, the name should be Dawar.

That he did not relieve his distress,
And did not afford consolation to his heart.
In those times many of the race of the faithful
Were confirmed in the faith by his means.
My tongue is unequal to the description
Of the advancement of religion to be ascribed to that man.
One year he thus formed a determination,
And proceeded to the fire-temple.
Then he prepared a feast
In the fire-temple of the city of Bansadah.
In the month of Azar and the day of Azar,
Was that feast held. O my brother!
With all the faithful and the Dasturs
That enlightened benefactor of the faith proceeded to the fire-temple.
In his sight all performed the Sijdah:
There they all performed worship.
Then one and all, with joy and gladness
Returned back from the temple.
Two or three months elapsed after this,
When that good person formed a design in his heart.
One day he assembled all the multitude
And spoke to them regarding that fire-temple:
He said—" I wish for the Sháh of Sháhs, from thence
I wish my friends to conduct him here.
If I daily see the countenance of the Shah,
Much benefit will be derived therefrom.
Besides, every year in journeying to the fire-temple,
I experience much pain, and that by reason of the distance;
For in that month much rain falls
And much time is occupied in the journey:
Therefore my friends what is better than this
Than that I should go there with certain persons of discretion,
And bring the sacred flame of Bahram
That I may behold it daily:
Our dignity and fortune will be increased thereby,
And the hearts of the faithful will be made glad."
All rejoiced at his words
And proceeded thither from Bansadah.*
With much honor they brought the sacred flame:
They prepared for it a magnificent temple:
They did homage to the Shah of the true faith:†
They all accompanied the procession.
Day and night his worship was performed

* Above it is said they brought the flame of Bahram to Bansadah, which is evidently a mistake.—E.

† i. e. to Bahram.—E.

By those appointed to that duty.
The name of the first was Nakin Ram:
His actions were always those of piety.
The name of the second Dastur was Kurshid;
His father's name was Kiyam-uddin Jawid.
The third Dastur was Janiyan-ibn-i-Sair,
Who was always attentive in devotional offices.
Their families and their tribes were with them,
They all attended on the Shah of Iran;*
With much zeal and ardour they abode in his service:
They were established with much splendour and dignity.
Those three Dasturs arrived at Nausari
With all their tribes from the distant journey.
And in those days the pious Dawar†
Gave assistance to the worshippers of the true faith.
I offer my blessing to him in this world,
And may peace be his resting place hereafter!
Unnumbered blessings and thanksgivings without end
Be offered to God the cherisher of his creatures,
That he directed my tongue in this fitting task,
And by his mercy opened to me a concealed door
May God in both worlds bless exceedingly
The Dastur who revealed to me this tale.
I am that poor person named Bahram,
Whose dwelling is the town of Nausari.
Know too, that my father is Kaikobad,
And that his heart rejoices in the remembrance of the Shah of Iran.
His father was the Dastur Hurmazdyar:
May his place be in light among angels!
Know, my friend, he bore the title of Sanjani,
For he was instructed in all wisdom:
From that wisdom he got the title of Sanjan,
Since he showed knowledge in affairs of religion.
They gave him also the name of the Dastur of the faith,
All affairs connected with the faith were expounded by him.
His abode was in the city of Nausari.
If you reckon you will find two hundred years have elapsed from his time.
A hundred thousand blessings and laudations be upon him
And on all those who accept the faith!
By the blessing and the command of God
I have thus related the history of this family of men.

* i. e. on the flame sacred to Bahram.

† A layman, particularly skilled in the Law, and observant of religious rites.—W.

When the men of the faith read it,
This work will bring a blessing upon me,
May more than hundreds of thousands of blessings rest
On that good person! benefactor of the world.*
May Anoshirvan return my spirit,
And obtain pardon for my soul from Yazdan!
Praise be to his spirit everlastingly—
Everlasting joy attend his soul!
Nine hundred and sixty-nine years have elapsed of the era of Yazdejird.†
Now that this history has been recorded by the pen;
In the month of Farwadin, and the day of Khurdar,
These verses were completed aright.
I have written and finished this history:
By this undertaking I have sought the favour of God.
I pray a blessing from the reader of this book
That my earth by water may be purified thereby.
May his soul with mine go to Anoshirvan,
That whatever be his will may befall me.
I have related this history according to my knowledge,
As I have heard it from my ancestors.
I have accomplished this work unaided by any instructor,
And thus have the flowers of this garden been reared.
(Lord of bounty a fortunate age)‡
Gives the year of this work and it was written in spring.
When I looked on this story I said within myself,
On considering this account of the faithful,
O reader, when you look on this good performance,
Pay to me the applause that is due.
Praise without end and countless thanksgivings
Be on Yustast the pious!
And may this favor be granted in thee by the mercy of God,
That you give to my soul the blessings of eternity!

Here ends this tale of Khurásán.

The end of the book.

On the day of Wah-minu-asman, in the month of Ardibihisht, in the latter end of the eleven hundred and twenty-ninth year of Shah Yaz-

* i. e., Zartusht.

† This fixes the date of the Kissah-i-Sanjan, at 1599, A. D.—W.

‡ This is the date by letters—a fanciful usage observed by Persian writers.

dejird, in the season of winter,* was written this book by the believer in the faith, the slave of God, the Mobad and son of a Mobad Darab, son of Faramurz, son of Minuchihr, son of Garshasp. From the reader a blessing is asked for me who am a sinner.

E. B. EASTWICK, Lieut.

Mahabaleshwar, March 16, 1842.

* This is the date of the transcription, A. D. 1759.

ART. V.—*Notes accompanying a Collection of Geological Specimens from Guzerat. By Professor* A. B. ORLEBAR.

To the Curators of the Bombay Museum.

GENTLEMEN,—IN hopes that the accompanying collection of rocks from Guzerat may facilitate further researches, I beg to submit them to you with the following notes and section, without which they will be nearly valueless.

The district from which principally they are collected is that known to the natives by the name Charotra, which is bounded on the west by the Suburmuttee, on the south by the Gulph of Cambay, and on the east by the Mhye. A line from Ahmednuggur to Morassa, curved northwardly, bounds the district whence my collection is made. The surface is one vast plain, which is bordered by hills, which, commencing north-east of Ahmednuggur, run in a semicircular direction through Roopal, Morassa, Malpur, Verpur, and (as I am informed) to Balasinor.

These hills are composed of sandstones and quartz rock in horizontal strata. The tops of them appear all to be on one level, and ascending one which embosoms the town of Malpoor, I seemed to be on a table land, stretching out in every direction, but broken up into countless patches. The sides of these hills are always steep, rising in cliffs from the level plain below. I did not visit Virapur or Balasinor; but from my extensive view at Malpur, and from the identity of all which I examined south of that place, I do not doubt but that all the specimens from *hills* in that direction will belong to the same series.

The lower beds of this formation are exposed in the beds of the

streams, which are very deep, and expose very fine sections of this sandstone, as in the Hautmuttee at Ahmednuggur, and in the Wartuck at Mohunpur.

The different beds are of very various structure. The upper beds are generally a very compact quartz rock (I. 1.) The hills north of Mehdasan (between Roopal and Morassa) are entirely composed of this, and about one hundred feet high. The stratification is, as usual, horizontal, but the beds have been divided by cleavages inclined to the south, at an angle of about 70°, so as to give every appearance of highly inclined stratification. The hill at Bakrol is also very high and is entirely of the quartz rock; and one cliff shows a beautiful veining of a lighter coloured quartz. At Malpur is exposed, in a quarry and hill, quartz beds, sandstone beds, again quartz, and again sandstone. The lower sandstone is of various colours, various hardness, and in beds of various thickness. It frequently abounds in mica, so as to approach the character of mica slate. But these beds are all small grained. It is sometimes beautifully variegated. It occurs variegated also at Pooral, (a village between Mohunpoor and Ahmednuggur,) and also at Ahmednuggur, where it is underlain by a deep red sand, containing little pebbles of quartz. At this place also the variegated sandstone overlies quartz rock. Above the town the fine sandstones are overlain with coarser sandstones approaching the character of conglomerates. And at Rhupal we find a very coarse large conglomerate composed entirely of quartz fragments and pebbles. At Mohunpoor the quartz rock alternates with the loose red sand. These facts are sufficient to show that this great formation of sandstones, conglomerates, and quartz rocks, in which quartz and mica are the only apparent minerals, is very various both in character and order.

The whole of this formation is covered with the sand which forms the soil of the Charotra. It abounds in mica. It is generally quite loose, without a pebble in it. In the southern part of the Charotra the sections of the rivers expose no other formation. The banks of the Mhye, composed of it, are more than one hundred feet high. Its stratification is generally horizontal, but its lower strata in the cliffs of the Mhye at Dewan are highly irregular and contorted. Between it and the older sandstone above described, there is at Ahmednuggur a gravel bed containing fragments of quartz, and at Mohunpoor its lower bed, immediately over the quartz rock, is full of similar large fragments.

This upper sand also surmounts the trap at Mohunpoor and Hursole. At the former place the upper strata are, a loose sand horizontal, then horizontal beds of conglomerate, and, lastly, irregular strata of sand containing pebbles, filling up the hollows in the depressions of the trap. At Hursole also the lower strata are a coarse conglomerate.

Trap occurs also at Satimba, where it is covered with the black soil. This is the only spot in which I found black soil, excepting near the banks of the Mhye.

From enquiries I made with regard to wells, I am inclined to suppose that the black soil alternates with the sand. But the black soil certainly overlies the upper or newer sand on the banks of the Nurbudda above Broach. It may be as well to observe here, that this upper sand and the black soil forms the surface not only of the Charotra but of the whole low land from Wallah to Dhanduka below the Kattiawar high lands, of the flat eastward of Ahmedabad to Verumgaum, and of the district between the Mhye and the Taptee.

Granite is exposed at Morassa, and is overlain by the newer sandstone, whose lower strata are a very coarse conglomerate of trap pebbles.

Mica slate is exposed in a stream between Mehdejan and Bakrol.

One rock only remains to be described. It is a rock of very various appearance, on which the town of Caparwanj is built. The specimen is exactly the same as the one in my possession of the laterite in the southern Mahrathi country between Belgaum and Dharwar.

The point, however, most worthy of the attention of geologists, is the existence of veins of lime. These veins reticulate, in every direction, the trap and the older sandstone, but never enter the newer sandstone. At Hursole and Mohunpur, the veins which come to the surface are cut off when they meet the sand. The sand immediately overlaying the trap abounds with kankar pebbles. These pebbles are not like those distorted concretions which are found elsewhere in India, and seem formed by the lime around roots, &c. &c., but are little rounded pebbles. They are found throughout Guzerat, both in the sand and in the back soil. The horizontal veins are generally the thickest.

The veins which pierce the older sandstone have so united with

the red sand, as to give all the appearance of brick and mortar. At Mohunpur they had thickened under the quartz rocks. At Ahmednuggur, under the town, the sandstone beds are bent upwards in a curve; below them are sandstone beds in their usual horizontal position; and between them, filling the space thus formed, is a mass of lime.

Returning to the trap at Hursole, broad veins, approaching the character of dykes, terminate in beds of lime which contain fossils. The fossils are a melania, pianorbis, limnea, and cyrene. These beds are near the river in a spot where the upper sand has been removed. They in some places contain large pebbles of trap; in some places they have the character of travertin.

Gogo.—Gogo is built of a conglomerate which is found on the shore. A good section is exposed south of the town, and from the only fossiliferous bed of this the specimens were taken. Conglomerates and sandstones alternate. The sandstone between Gogo and Rutnapoor, a village to the S.E. of Gogo, contains selenite. The soil around Gogo is a loose dark soil, abounding with fragments of the conglomerate. This soil is bounded on the north west by a low range of trap hills, a little south of the village of Seedeysir. It is so deep that an exposure of fifty feet does not show its depth between Gogo and Booleysir; but, towards the above-mentioned hills, it lies upon trap, and thins off to a thickness of a few inches. This trap is penetrated by lime veins, one of which I traced upwards into the conglomerate soil. The conglomerate soil is interrupted at Booleysir, by a red and white rock, which is sometimes stratified, and which is continued in hills of iron gravel to near Boodeil.

Seedeysir to Warteg is trap, with veins of lime, which, in one spot near Warteg, unite, so as to have the appearance of broad white dykes in the dark rock.

In the vast plain of black soil, which extends from Warteg to beyond Dhanduka, rises an isolated group of granite hills: they are known as the Chamardi Hills. All which I observed was granite; but Mr Jordan of Ahmedabad gave me the specimens of slate which he took from the westernmost hill. Low on the flanks of the granite hills lie, in highly inclined strata, beds of sandstone, composed evidently from the granite. In one of these beds I found tubes of

limestone reticulating the surface, and passing downwards in all planes without order, but all connected.

The bed of the river at Balawarra is composed of limestone, which lies in masses in the neighbouring black soil.

I observed no other rocks in my route on the western side of the Gulph of Cambay. From Dhanduka to Koth, the road is over the singular marsh land which extends from the Gulph of Cambay to the Runn of Cutch. From Koth the vast upper sand of the Charotra commences.

On the eastern side of the Gulph, from the Mhye to the Taptee, the same deep sand of the Charotra is overlain frequently by black soil; and in one spot only did a rock make its appearance: this was between the Nurbudda and the Keem. It seems a sandstone.

The Rajpeeple Hills are seen from Broach, and I thought it worth a day to examine the site of the famed cornelian mines. The trade in them has become lately so unprofitable that the mines have been given up, and the excavations have been nearly filled up, so that I had no opportunity of examining the strata. The surface of the hills in which they are situated are so disintegrated, that I could form no opinion as to the nature of the rock. As the specimens shew, it is a kind of conglomerate; but from the shape of the hills, I should account them of volcanic origin. The plain below is covered with a gravel which appears of the same character as the disintegrated conglomerate. This plain, as far as the Nurbudda, is beautifully undulated by little hills, which abound in iron.

Below the cornelian hill is the village of Ratnapoor, and in the bed of the river is exposed a section of conglomerate and sandstone beds. They are inclined at an angle of 70°; and, as the section is exposed for several hundred yards, must be a portion of a very vast formation. The dip is north by west. The lowest beds are a fine marl, which contained a large angular fragment, of which A. R. is a part. One of the beds contained the bodies J. C. The beds are intersected by vertical veins of lime. Two of these veins, which were some inches broad, I took to be small trap dykes; but on examination they also have proved to be lime with alumine.

REMARKS ON THE ABOVE SPECIMENS.

It would be premature to offer many remarks on the structure of the above low country surrounding the gulph; but perhaps a few conjectures may not be useless to future enquirers.

That the cessation of the cause or causes which produced the lime-veins may be regarded as an epoch in these rocks, there can be no doubt. The lime-veins penetrate the trap, the older sandstones, the conglomerates, and conglomerate soil of Gogo, and the conglomerates of Ratnapoor; but never enter the newer sand and conglomerate of the Charotra, or the gravel of Ratnapoor. This is observed not in a place here or there, but it may be seen in innumerable localities, so as to be quite a striking characteristic of the rocks. That subsequently the trap was exposed to considerable action from water is also evident from the conglomerates of trap pebbles which form the lower strata of the newer sand, whatever rock it may happen to overlie. And also in the lower strata of the newer sand, trap pebbles are common mixed with pebbles of kankar, which are so abundant as to supply the country with lime exclusively. These pebbles, I repeat, have no similarity to the concretionary kankar of the Deccan and Concan: they are strictly pebbles. The mass of the sand itself may have been formed from the older sandstone and granitic rocks, which, like the sand in question, are characterized by a peculiar abundance of mica. These considerations seem to prove that the newer sand was formed by a diluvial action upon the trap sandstone and primitive rocks.

But having shewn that the lime-veins are older than the newer sand, it follows that the little lime-beds at Hursole are also newer. And since these lime-beds contain river shells,—of which certainly some, and probably all, are identical with those now existing in the rivers of Guzerat,—it follows that the sand is pretty certainly very recent. And further, since there must, at the time of those shells being imbedded, have been rivers in Guzerat,—and since the sand appears to have been formed by a sea, it follows that the present state of things in Guzerat must have been interrupted by a flood. The great irregularity of the lower strata of the sand seems to shew that the flood was most tempestuous; and the absence of organic remains shews that no mollusca could endure it.

With regard to the origin of the lime-veins, the travertine structure of the lime at Hursole seems to prove that it is a deposit from a mineral spring; and that it does originate from below, I am led to believe, 1st, By the great thickness of the horizontal veins in the trap compared with that of the vertical veins; 2d, By the appearance above described at Ahmednuggur; and 3d, By its abounding in the lower soft strata of the older sandstone, but never penetrating the upper harder strata under which the veins frequently accumulate.

The upper sand never contains any fragments or pebbles of the Caparwanj or of the Rattanpoor red conglomerate; I conclude, therefore, that these iron formations are more recent. The Caparwanj rock is very various in appearance, but many specimens are identical with those of the southern India *laterite conglomerate*. This laterite conglomerate occurs in veins in the pass through the sandstone ridge between Badamee and Dharwar; and the Caparwanj rock, in many places, has all the appearance of lava streams.

If the Rattanpoor conglomerate is also volcanic, it will account for the highly inclined strata of the conglomerates, which will probably be found identical with the Gogo fossiliferous strata on the other side of the gulph.

The older sandstone may be identical with that described by Mr Fraser (Geol. Trans., vol. i., new series) as occurring at Bhaug; with the sandstone of Bundelcund, described by Captain Franklin; and with the diamond sandstone ridges of the south. They all rest on the primitive rocks, are all unfossiliferous, all have beds in which quartz predominates, and all seem to present the same scenery, indicating their having been subjected to similar action.

The whole system, then, I conjecture to be as follows:—The primitive rocks existing, trap rocks completed the general character of the country as it now exists. The older sandstone was deposited, raised, and subjected to eroding causes. The fossiliferous beds of Gogo, and the conglomerate of Rattanpoor, were formed by the Narbudda and other rivers carrying down detritus and fossils into the gulph. The lime veins formed. The newer sand and black soil formed by a flood. Lastly, volcanic eruptions through Caparwanj, Beerpoor, and forming the Rajpeepla hills.

The connection between the trap and the older sandstone might be

easily determined at Mohunpoor, were coolies employed to remove the rubbish which now covers their juncture. It is possible also, that, in this place, lime-veins may be traced from one of these rocks into the other.

The conglomerates at Rattanpoor should be carefully examined. Fossil beds will probably be found.

The Perim beds have never yet been so examined, as to determine certainly whether the fossils are in situ.

The hills at Balasinor and Beerpoor should be examined, in order to connect the above described specimens with those described by Mr Hardie, Asiatic Researches, vol xviii. p. 82.

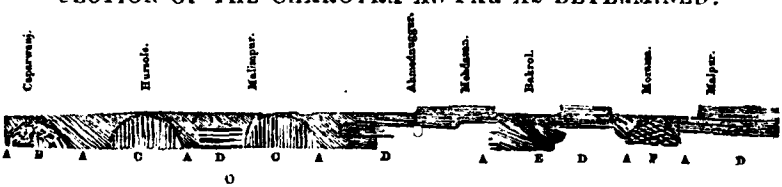
The existence of the species of river mollusca found in the lime of Hursole, whether all be now alive in the river, should be carefully inquired into. I have deposited, in the Museum, specimens of the melania which I found in the river at Warteg; but I did not find them alive. The limnea appears, certainly, and so also the planorbis, to be the same as those now living. Shells of the cyrene are common in the rivers; but I found none alive, although I was informed that they live under stones in the shallows of the Nerbudda. It is remarkable that neither the common unio nor the common paladina, which both abound now in the rivers of Guzerat, was discoverable in the Hursole lime-beds.

I have the honour to be, Gentlemen,

Your's, &c.

Bombay, *April*, 1842. A. B. ORLEBAR.

SECTION OF THE CHAROTRA AS FAR AS DETERMINED.



AAAAAAA Upper Sand.
B Limestone conglomerate.
CC Trap.
DDDD Lower Sandstone.
E Mica Slate.
F Granite.

VI.—*Note on the Ram Ghat. Communicated by Professor* A. B. ORLEBAR.

VIEWED from the top of the Ram Ghat, the summits of the highest neighbouring hills appear on a level with one another and the observer, and seem to have formed one table-land continuous with the plain of trap on which Belgaum is situated; but which are now separated from one another by deep and precipitous ravines. These summits are all tabular, but between and in the midst of them are lower hills whose summits are conical. All, however, are nothing but the broken edge of the great Deccan table, which rises here in a steep escarpment from the plain of the Konkan, throughout the line marked by geographers as the Western Ghats, but no where more remarkably than in this spot.

Along the plain of the Konkan, from Vingorla to the foot of the Ram Ghat, are found in succession granite overlaid by laterite, laterite interrupted by mica schist and hornblende rock, and lastly hornblende rock. It is to be observed that the hornblende rock at the base of the Ghat is horizontal; but that in other spots it is inclined at an angle of 30° to the south.

After leaving the hornblende-rock, I commenced the ascent of the ghat over a hill of trap; the road is there cut through successive beds of hornblende rock and gneiss until near the summit, when it finishes with trap.

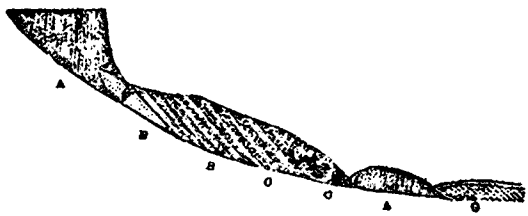
The beds of hornblende-rock and gneiss are thirty in number, and alternate The dip is towards the west, at an angle of about 60.

The gneiss is remarkably deficient in mica; although, in the first and lowest bed, there are some few strata of mica slate. The felspar is in general white, but is sometimes flesh coloured. The quartz is either white or smoky The rock is frequently in so crumbling a state as to have more of the appearance of a sandstone than of gneiss. The third bed contains much green earth.

The hornblende rock is universally very fine grained, except in one series of strata, which form a subordinate bed in the last bed, which is of great thickness; and here the hornblende is fibrous. The fourth bed contains flesh coloured crystals of felspar. The tenth bed is not a foot thick. There are singular contortions in the twenty-fourth bed. The junction of the gneiss and trap is very apparent at the lowest bed which is exposed at the higher part of the ghat. The latter first appears under amygdaloid, which is decomposing in globes; the

trap is then interrupted and gneiss is the superficial rock; and a few yards farther, is a single globe of basalt resting on the top of the gneiss strata. Also in the same bed of gneiss, some yards further, a dyke of trap cuts the strata which it has slightly disturbed.

SECTION OF THE RAM GHAT.



AA Trap. BB Gneiss. CCC Hornblende Rock.

METEOROLOGICAL OBSERVATIONS, BOMBAY MAGNETIC OBSERVATORY.

21st JANUARY, 1842.

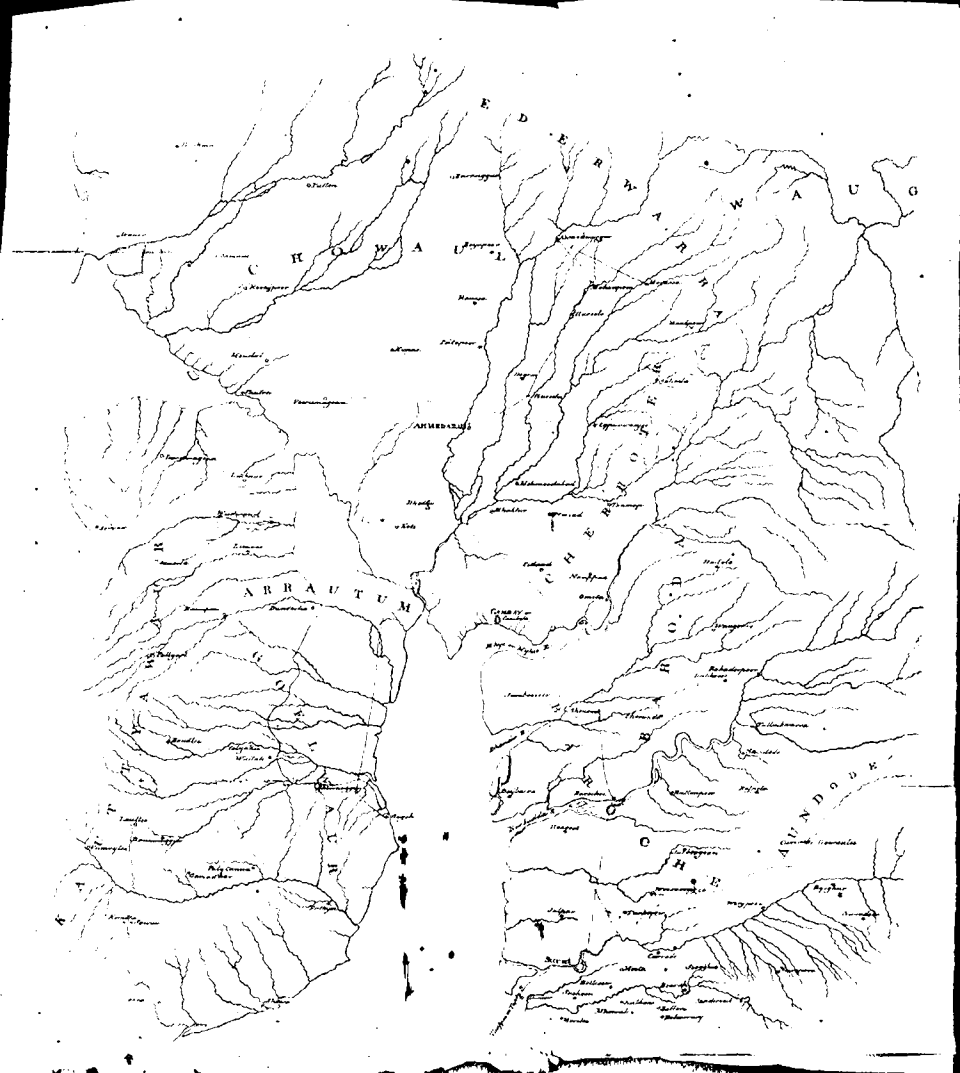
Bombay mean time.	Hours.	Standard Barometer.	Thermo. Attd.	Thermo. Detd.	Thermo. Dry.	Thermo. Wet.	Barometer. Corrected	Wind.	Remarks.
6	A. M.	29·970	75·2	75 2	75 0	69·0	29·837	N.	Clear, with cirrostratus.
7	..	·976	73·6	73 6	74·0	67·6	·848	N. by E	Cumuli.
8	..	0·002	75·5	75·5	75·[illegible]	67·9	·871	N.N.E.	⅝ Cumulostratus.
9	..	·034	78 8	79 5	79·5	68·9	·893	..	⅛ Cirri and Cirrostratus.
9½	..	·034	79 5	80 5	80·5	68 9	·891	E by N	.. ..
10	..	·034	80 0	81·3	81·5	68·5	·890	N.	.. ..
10½	..	·026	81·6	81 5	80·8	68·5	·877	N. by E.	.. ..
11	..	·000	80·2	80.0	79 9	70·0	·855	N. N. W.	Clear, breeze fresh.
0	..	29 984	80·5	80 4	80·2	70 4	·839	N. W.	.. ..
1	P. M.	·950	80 8	80·6	80·5	72·0	·804	..	⅛ Cirri and Cirrostratus.
2	..	·934	81 0	80·7	80 6	72·0	·788	..	.. ..
2½	..	·924	81·2	80·8	81 0	72·0	·777	..	.. ..
3	..	·920	81·2	81·0	81·0	71·8	·773	..	.. ..
3½	..	·910	81·2	81·0	81·0	72·[illegible]	·773	....	.. ..
4	..	·928	81·2	80·8	80·8	72·0	·781	..	.. ..
4½	..	·934	81·0	80 6	80 0	71·5	·788	..	Strong Breeze.
5	..	·936	80·8	80·2	80·0	70 5	·790	..	⅛ Cirrus and cirrostratus.
5½	..	·936	80 0	79·8	79 5	69·5	·793	..	⅛ .. ..
6	..	·930	78·8	78·5	78·2	70 0	·790	..	⅛ Cirrostratus, strong breeze.
7	..	·930	78·8	78 6	78·0	69 6	·810	..	⅛ Cirrus, strong breeze.
8	..	·960	78 5	8·0	77 8	72·6	·821	..	Clear, with strong breeze.
9	..	·986	78·2	77 4	77·2	67·2	·848	..	.. Cirrostratus in the west.
9½	..	·996	77 9	76·4	76·0	64·2	·859	..	.. Gentle breeze.
10	..	·996	77 5	76·1	75 8	64·6	·860	..	.. ..
10½	..	·986	77 0	76·0	75 6	65·6	·852	..	.. ..
11	..	·970	76·8	75·8	75·6	66·8	·836	..	.. Nearly calm.
0	..	·966	76 5	75 5	75·4	67·5	·838	..	.. Fresh breeze
1	A. M.	·958	76·5	75 5	75 4	68·5	·825	..	.. Gentle breeze.
2	..	·950	75·2	74 6	73 6	67·0	·820	..	.. ..
2½	..	·940	74 9	74 0	73·6	68·0	·802	..	.. ..
3	..	·930	74·5	74·0	73·6	68·5	·803	..	.. ..
3½	..	·930	74·.	74·0	73·5	69·0	·805	..	.. ..
4	...	·930	74 0	74·0	74·3	69·0	·806	N. W.	.. Strong breeze.
4½	..	·730	74 5	74 0	74·0	67·5	·804	..	.. ..
5	..	·930	74·5	74 0	73·8	66·3	·803	..	.. ..
5½	..	·930	74·0	73·5	73 8	64·0	·804	..	.. ..

21st FEBRUARY, 1842.

Bombay Mean Time.	Hours.	Standard Barometer.	Thermo. Attd.	Thermo. Detd.	Thermo. Dry.	Thermo. Wet.	Barometer Corrected.	Wind.	Remarks.
6	A. M.	29·900	74·6	7 . .	72·2	71·6	29·773	Calm.	Calm.
7	..	·920	74·8	4·4	74·	7··	·792	N.N.E.	Gentle breeze.
8	..	·942	75 8	76·4	75·8	76·7	·811	N.E.	.. ..
9	..	·966	77·8	77··	·7	7··	·819	..	.. ..
9½	..	·976	78·9	79·4	78·5	77·5	·826	..	.. ..
10	..	·976	79 9	80 1	8··	78·0	·823	..	.. ..
10½	..	·970	81·0	82·9	80 0	79·0	·814	N.W.	.. ..
11	P. M	·956	81·0	81·2	0	··	·00	..	.. ..
0	..	·93·	82·0	82·5	82·5	9·0	·781	..	.. ..
1	..	·9·5	82··	2·2	81··	72··	·755	..	.. ..
2	..	·880	82 9	8·. 5	82·0	74·2	·728	..	.. ..
2½	..	Lost	....	....	....	....	....	..	.. ..
3	..	·858	33··	82 9	82.7	73·0	·706	..	.. ..
3½	..	·856	83··	8· 1	83·0	3··	·703	N.W	Almost clear.
4	..	·854	83 3	82··	82 5	73·7	701	..	.. ..
4½	....	·850	83··	2·.	82 4	73·3	·697	..	.. ..
5	..	·848	83 0	82·0	81 3	73·2	·696	..	.. ..
5½	..	·854	82 5	81·2	80 5	72·0	·703	..	Clear, with gentle breeze.
6	..	·866	82·4	81 0	81 2	72·5	·715	..	.. ..
7	..	·878	81·1	9 7	79 0	74·5	·732	..	.. ..
8	..	·90	80 0	78 8	78·2	71·4	739	..	Fresh breeze.
9	..	·908	79·6	78 3	77·5	71·0	·766	..	.. ..
9½	..	·916	79··	77.5	77·	71·5	·776	..	Nearly calm.
10	..	·922	78 9	77 .	77 6	70·8	·782	..	.. ..
10½	..	·918	78·5	77 5	77 0	71·0	·778	Calm.	Calm.
11	..	·918	78·1	7·5	77·	71 0	·779	..	.. ..
0	..	·910	78··	77·1	77·0	70 0	·772	..	Clear and calm.
1	..	·8 80	77 8	76 5	7·.2	7·.0	·755	..	.. ..
2	..	·876	7·.5	76 0	6·	68·5	·740	N. W.	Gentle breeze.
2½	..	·876	7··	76 0	76·0	68 5	·741	..	.. ..
3	..	·879	77 0	76··	75·5	70 0	·736	..	.. ..
3½	..	·879	76··	75·5	75·4	70·0	·736	..	½ Cirri gentle breeze.
4	..	·879	6 .	75·5	75 0	70 0	·736	..	.. ..
4½	..	·879	76 ·	75 5	75 0	70 0	·737	..	.. ..
5	..	·879	76 1	75··	75 0	71 0	·735	..	.. ..
5½	A. M	·876	76·0	75·.	75·0	71 0	·741	..	.. ..

21st MARCH, 1842.

Bombay Mean Time.	Hours.	Standard Barometer.	Ther Attd.	Ther Detd.	Thermo. Dry.	Thermo. Wet.	Barometer Corrected.	Wind.	Remarks.
6	A.M.	29·876	77 0	76 8	76·2	72·1	29.742	N.E.	⅛ Cirri and cumuli.
7	...	·880	76·5	76·0	75·5	71·5	·757	..	.. ..
8	..	·916	77·5	78·2	77 2	72 2	·780	N.E.E.	Clear, light breeze.
9	..	·926	79 0	80·0	79 0	73 0	·786	E.	.. ..
9½	..	·926	79·9	80 9	79·9	73 2	·783	..	.. ..
10	..	·926	80 8	1·8	81 0	73 8	·782	..	.. ..
10½	..	·926	81 5	8. 5	8·.5	73 8	·778	..	Clear, with cumuli in the W
11	..	·915	81 5	82·2	80 5	73·0	·76·	W.	.. cumuli in the N.
0	P. M.	·900	81·1	80·5	80 5	73·0	·753	..	.. ..
1	..	·876	81·3	81·0	81,0	74·0	·729	..	.. ..
2	..	·848	8·.0	81·5	81·5	74 ·	·699	..	.. ..
2½	..	·840	82·1	81·7	2·0	74 5	·691	..	.. ..
3	..	·832	82·5	82 3	82·4	74·.	·681	..	.. ..
3½	..	·826	8· 7	82 1	82 5	4 5	·675	..	.. ..
4	..	·821	82.5	82·3	82 0	74 6	·673	..	.. ..
4½	..	·824	82.2	82·0	82·0	75·0	·674	W. by N.	.. ..
5	..	·824	81·8	81·5	81·5	75 ·	·675	..	.. ..
5½	..	·840	81.5	81 1	81·0	76·9	·692	..	.. ..
6	..	·848	81·2	80·5	80·0	74·0	·701	N.W.	.. Fresh Breeze.
7	..	·856	80 5	79 2	79 0	73·5	·711	..	.. ..
8	..	·870	80·0	79·1	79·0	74 0	·727	..	.. ..
9	....	·900	80.8	79 0	78 9	74·5	·757	..	.. Gentle Breeze
9½	..	·900	79·9	78.9	78·8	74·0	·757	..	.. ..
10	..	·900	79·8	7·.8	78·7	73 9	·757	..	.. ..
10½	..	900	79·5	78·5	78·0	73 6	·758	..	.. ..
11	..	·900	79 4	78·4	77·8	73·6	·758	..	.. ..
0	A.M.	·896	79·0	77·5	77·0	73 0	·746	..	.. Nearly calm.
1	..	·874	78·7	77·2	77·0	73·0	·735	Calm.	.. Calm.
2	..	·866	78·5	77 3	77·0	73·0	·727	..	.. ..
2½	..	·858	78·4	77·3	77·0	73 2	·719	..	.. With cumuli in the W.
3	..	·858	78·2	77·5	77·2	73·5	·720	..	⅛ Cloudy.
3½	..	·858	78·2	77·5	7·2	73·8	·720	N.W.	.. ..
4	..	·860	78·2	77 5	77 5	73·5	·722	..	.. ..
4½	..	·860	78·2	77 5	77·1	73·2	·722	..	.. ..
5	..	·860	78·2	77 0	76·5	73·0	·722	N.	.. ..
5½	..	·870	78·1	76·2	75·8	73·7	·732	..	.. ..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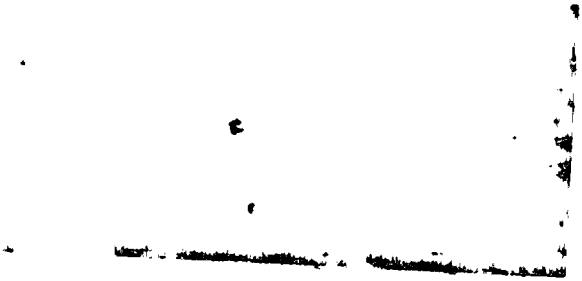


JOURNAL

OF THE

BOMBAY BRANCH

OF THE

ROYAL ASIATIC SOCIETY.

APRIL, 1843.

ART. I.—*Note on Allore and Rohri.* By Lieut. E. B. EASTWICK.

The country of Sinde presents but a scanty field for the researches of the Antiquarian, and but few monuments which could prove of use to the writer of history. Though traversed by the classic waters of the Indus and trodden by the armies of every invader of Hindustan, scarcely any work of bygone ages reminds the traveller of the past, or aids him in removing the obscurity in which the early history of this region is enveloped. Even the site of the once most celebrated cities of Sinde is disputed, and though perhaps but eight centuries have elapsed since the prosperity of Allore and Brahminabad was at its height, no record of their inhabitants is left; and vague tradition alone informs us that the mouldering heaps we now behold, were once the abode of thousands, and the seat of empire. In the Chachnámáh and Mausumnámáh we find no account of the ages which intervened between the invasion of Alexander and the conquest of Sinde by the generals of the Caliphs, except indeed a few names of kings and some puerile legends. We are left without any guide as to the natural changes which must have happened in that lapse of time, and which, if we may argue from what has occurred more recently, must have been of no common magnitude. It is therefore vain to speculate on the ancient geography of the tracts bordering on the Indus, and to build on conjectures which must be purely arbitrary. With reference however to Allore, once the capital of the Hindú Rájas who governed Sinde,

some scanty information may perhaps be collected, and among other things it appears possible to fix the date on which the Indus abandoned that ancient city and directed its course into a new channel between Rohri, and Sakkar. In the small island of Khwaja Khizr, nearly opposite Rohri, is a masjid whose appearance bespeaks antiquity. In this building is the following inscription :—

چون این درگاه والا شد هویدا خضر باخط شیرین در نو شته
که آب خضر دارد در حوالي پي تاریخش شد از درگاه عالي
۳۴۱

When this Court was raised, be it known, That the waters of Khizr surrounded it.

Khizr wrote this in pleasing verse Its date is found from the Court of God.

If this date ۳۴۱ be correct, the masjid was erected in the year 952 A. C. about 250 years after the Muhammadan invasion of India. The mistake, if there is any, is intentional, for the literal date corresponds to that of the figures. Thus :

د	=	4	درگاه عالي
ر	=	200	
گ	=	20	
ا	=	1	
ه	=	5	
ع	=	70	
ا	=	1	
ل	=	30	
ي	=	10	
		341	

But the inscription is corroborated both by tradition and by other circumstances which present themselves to the local inquirer. The popular legend tells us, that a shepherd named Bájee, whose hut stood where the Mahal of Bájee, one of the divisions of the town of Rohri, now stands,

observed at night a bright flame burning at some distance from him. Thinking it had been kindled by travellers, he sent his wife to procure a light from it, but as often as she approached it vanished. She returned and told her husband, and he disbelieving her report, went himself and then discovered that it was indeed a miraculous manifestation. Awe-struck with what he had seen, he erected a Takea on the spot, and devoted himself as a fakir to the religious care of the place. Soon after this, the Indus altered its course, and abandoning the walls of Allore encircled the ground on which the Takea of Bájee stood, and which is now called the island of Khwája Khizr.

There is another story to be found in the Chachnámáh which relates that the Rája of Allore was desirous of possessing the beautiful daughter of a merchant who resided in his city. The unhappy father, unable to oppose the wishes of the king, entreated that a respite of eight days might be allowed to him, and having spent that time in fasting and prayer, he was miraculously conveyed with his daughter and all his wealth to the island of Khizr, the river at the same time deserting the city of Allore, which was thus doomed to desolation for the tyranny of its king.

However the truth of these tales may be, the existence of the legend gives strength to our belief in the genuineness of the inscription. We find too, that among the tombs in Rohri and Sakkar, though for the most part they are of the age of Akbar, there are some whose antiquity ascends nearly to the date in the inscription given above. In the island of Sati opposite the fort of Bakkar is an inscription to this effect.

میر والا نژاد سعید الدیں — آن بهر فن یگانه و کامل
دل ازاین خاکدان گرفت اورا — جنت عدن ساخت گه منزل
سال فوتش چون جستم از دل بکفت — شد الفر دوس میر صاحب دل

Seyud uddin born of a noble house. His soul removed from this house of clay,
Unequalled and perfect in wisdom. He made paradise his abode.
When I sought the year of his death my heart responded,
The Mir, lord of my heart, became an inhabitant of Paradise.

Now these words would give the date 384 A. H. as follows:

40 =	م	
10 =	ي	
200 =	ر	
90 =	ص	
1 =	ا	میر صاحب دل
7 =	ح	
2 =	ب	
4 =	د	
30 =	ل	

384 A. H.

The appearance of the tomb is extremely ancient, and justifies our belief in the correctness of the date. It is situated at the eastern extremity of the island and is much dilapidated. It seems probable, therefore, that the change in the course of the Indus from Allore to Rohri actually took place in the year 341, A. H. as given in the inscription in the Masjid of Khwája Khizr, and that soon after the divergence of the stream, the population of Allore began to migrate to Rohri, and among them probably came the family of Seyuds on the tomb of one of whom appears a date only fifty years subsequent to that of the Masjid of Khwája Khizr. In assigning an antiquity of eight centuries to Rohri and even to Sakkar, it will not be thought that their foundation is carried too far back, for it appears that several centuries ago they had reached a high state of wealth and importance. This is attested by the numerous and costly structures erected prior to and during the reign of Akbar, and by the resort of Seyuds who emigrated hither from the most distant countries. Akbar conquered Sinde in 1572. A. D. and though nearly three centuries have elapsed, the buildings erected during his reign are evidently among the most modern of the edifices which cover the hills on each side of the river. The former Masjid of Rohri bearing the following inscription, will serve as an instance: —

The Khusrau of the age, the asylum of the faith, Sháh Akbar,
Giver of crowns and subduer of kingdoms.
The Sháh, whose host is as the stars, and whose throne is the sky,
Defender of the law and leader of the age.
Whose servants equal Cæsars and Emperors,
Whose nobles are great as the Khan of Tartary.
The lowest of thy servants, O Sháh!
The chief resembling Jamshíd, throne of the age,
Leader of bright soul, bounteous as the ocean,
Pillar of liberality and storehouse of benefits.
Fateh Khan whose blood shedding scimetar
Laid waste the foundations of injustice,
Built this cathedral for a heavenly recompense,
And in the hope of a more enobled abode in Paradise.
Heart expanding as the holy Caabah,
Soul delighting as the gardens of Eden,
May it continue uninjured by the lapse of ages.
I sought in my mind for a word corresponding to its date.
The Khan built this Masjid and bid adieu to life.

No. 2. Another example will be found in a small domed building, which now forms part of the Agency at Sakkar, which is of the time of Akbar, but of perfectly modern appearance. It bears the following inscription:—

"In the time of the Khálifat of the great Sháh, most revered king of kings, brightness of the faith, Muhammad Akbar the king, exterminator of infidels, may God establish his kingdom!

"This building was erected for good purposes by the noble Muhammad Maäsum of Bakkar, the son of Seyud Sífá Tarmází, for the common benefit of all Músalmáns. — Whoever makes a tomb in this edifice, the curse of God, and of the prophet, and of angels, and of the faithful, on him rest! 1008. A. H."

Opposite is another building with these verses.

"Sweet spot that like the gardens of the blest,
Breathes heavenly pleasures to the enraptured breast,
Mansion of bliss! thy date let strangers find,
In hailing, thee the Eden of the mind. 1006. A. H."

Contrasted with these buildings, the tombs on the hill overlooking the

Agency, seem evidently of a far higher antiquity. Among all these ruins there is no trace of any Hindú place of worship. Not even at Allore, though once governed by a Hindú dynasty, is there any specimen of Hindú architecture to be found. There are some circular towers which would seem very ancient, and the tracery and carved work of which is laid on to the walls in a very rude fashion, but these are nevertheless tombs of Músalmáns from the Kabar in the inside turned towards the Kiblah. What is said to have been the Kót and palace of the Rájas, is now a vast mound of undistinguishable ruin. In one place where Mir Rustam Khán, the Khyrpore chief, caused an excavation to be made, the wall has been laid bare and appears to be of great thickness, about twelve feet as nearly as I could guess. The Mir was not rewarded for his labour by discovering any thing, and the work was soon discontinued from superstitious motives. The distance of Allore from Rohri is about five miles, and the road passes over a bridge to which an undue antiquity has been ascribed by some. There is no reason however to suppose it older than the statements of the natives would make it, that is, about two centuries. It is plain, that it never could have been thrown across the main stream of the Indus, for the height of the centre arch is only fourteen feet, and the whole length of the bridge does not exceed six hundred. Long after the main river had deserted Allore, it is probable, that a small body of water may have continued to flow in the ancient channel, across which this bridge was thrown either by Muhammad Maäsum, or some other munificent noble of that age. After crossing the bridge you come upon a small village, containing about sixty families, of whom two-thirds are Músalmáns, and the rest Hindús. They are subject to little exaction from the Amírs, and find a sale for the produce of their farms among the votaries of Shakar Ganj Sháh. From this village an extensive ridge of ruins is to be traced in a north-easterly direction. In this huge congeries, there is no inscription to be found, or any thing worthy of notice, except a picturesque ruin, which bears the name of Alumgír's Masjíd, and two tombs of Seyuds. Who these worthies were, is now forgotten, but their names remain, Shakar Ganj Sháh and his Khalifu Khutáb Uddin Sháh. The tomb of the former is a celebrated ziyárat, and the people of the neighboring villages make a pilgrimage to it twice monthly. It has no dome or edifice over it, but is a plain white sepulchre with a neat border of carved flowers resembling the fleur de lys. Among the ornaments which the piety of the devotees had suspended over the tomb,

were some stopples of decanters, but evidently in ignorance of their use. For on its being explained to the Mújáwar, that these ornaments had originally belonged to wine vessels, he was greatly scandalized and forthwith threw them away, laying all the blame of their suspension on his wife. I could discover nothing else at Allore worthy of notice, except two stones in the bed of the river, bearing an inscription to the effect, that they were set up by Muhammad Maäsum to mark the ancient course of the stream. This noble Seyud was the founder of many costly works in the vicinity if Rohri. He is buried in the cantonment at Sakkar at the foot of a tower ninety feet high, which he erected and which overlooks the country for many miles. The person who claims to be his descendant, has already prepared his last resting place in the same cemetery. At Robri they pretend to possess a hair and a half from the head of the Prophet,—the Múi Mú bárik, as it is called. They are set in a gold tube adorned with large rubies, and a great deal of mummery is observed in displaying them. The Mújáwar gave me the following account of their translation to Rohri:— "In the year nine hundred and fifty-two of the Hejira, Makhdin Miyán Abdúlbáki Sadíkí, the Mújáwar of the Mir Múbárik, arrived at Sakkar from Istambol, and gave such convincing proofs of the genuineness of these blessed relics, that all the great and pious men of the time visited them as pilgrims, such as Sháh Hyder Hakáni and Múkhdum Abdúlmalak. The office of Mújáwar then descended on Hají Muhammad bin Abdúlsatár Sadíkí, who enjoyed it for no less a period than eighty years. After him Sháh Hafiz Muhammad Izhák became Mújáwar, and Hafiz Mahummad Riza and Hafiz Mahummad Múrád, the sons of the said Haji Mahummad, and to the descendants of Hafiz Mahummad Izhák the office now belongs."

II.—*Description of a Copper-plate Grant found at Kháreptán, on the Viziadurga river; with a fac-simile, a transcript in Balbodh, and an English translation.* In a letter to the President of the Society: By Ball Gungadhar Shastree, Esq.

Bombay, 19th November, 1842.

My dear Sir,

1. Having been informed, that a Brahman of Kháreptán, a town situated on the river of Viziadurga or Gheria, had, some time ago, acci-

dentally found a Copper-plate Grant, I succeeded in obtaining the loan of it through a friend; and I have now the pleasure of sending you a *fac-simile* of it, as well as a transcript in Balbodh and an English translation, for being laid before the Bombay Branch of the Royal Asiatic Society, should you deem it worthy of the notice of that body.

2. The four plates composing the Grant are connected, as usual, by a ring running through a hole, and bearing the accompanying figure, which, from having the box of Lingam on its neck and a snake twining round its arms, would appear to be that of a devotee of Shiva. The inscription on the plate is dated in the year 930 of Shalivahana. It is peculiarly rich in the genealogies of the princes of the Deccan and Conkan; containing in addition to a catalogue of the ancestors of the Donor, — a tributary of the Conkan,—two names of Chalukyas, then holding sovereign power in the greater part of the Deccan; and no less than fourteen names of the Yadava kings, whose authority was subverted by a member of the former family, about the end of the ninth century.

3. The records of the Chalukya and Yadava dynasties, already found and decyphered, have generally corroborated each other; and the names as well as the order of succession of the kings of those families, have been made out on the concurrent testimony of a mass of inscriptions collected by Mr. W. Elliott, of the Madras Civil Service, and Mr. W. H. Wathen, the late Chief Secretary to the Government of Bombay. Great deal, however, yet remains to be done in completely tracing the lines of these kings; and it is of great importance to procure additional documents in support of the facts already brought to light, or in elucidation of the points hitherto regarded as doubtful.

4. In the grant of the Chalukya kings, which I had the honour of presenting to your Society through Professor Orlebar, last year, I verified the names of some of the early kings of that race, mentioned in Mr. Elliott's tables, in No. VII of the Asiatic Society's Journal, for May 1837. In the one that accompanies these remarks, there occurs the name of Teilapa, who recovered the dignity of his race from the Yadavas, and that of his son Satya Shri, both of which are to be found in Mr. Elliott's list. The accompanying inscription describes the latter king as reigning in the Shaka year 930, (1008 A. D.) or one year after his accession to the throne, according to the authority quoted above. It also confirms the temporary alienation of the power of the Chalukyas in the ninth century, and the subjugation of the princes of Rashtra Kuta by Teilapa, as mention-

ed in a copper-plate grant found at Meritch, and published with a translation by Mr. Wathen in No. V. of the Asiatic Journal, for March 1836. This fact appears, moreover, to be supported by the authority of Col. Tod. (p. 2, No. VII. Assiatic. Jour.)

5. The names of the Yádava kings of Ráshtra Kuta require some consideration. Those given in the enclosed grant, though agreeing generally with the list given by Mr. Wathen in p. 105 of No. V. of the Asiatic Journal, on the authority of a grant found at Kardla, dated Shaka 894, (or A. D. 973), differ from them in more than one instance. I give both lists below for the sake of comparison :—

The accompanying Plate.	*Kardla Plate.*
1 Danti Durga.	1 Nandi Durga.
2 Krishna Rája, (his paternal uncle).	2 Krishna Rája, his paternal uncle.
3 Govinda Rája.	3 Govind Rája.
4 Nirupama.	4 Nirupama, his younger brother.
5 Jagat Tunga.	5 Jagat Rudra.
6 Amogha Varsha.	6 Madanogha Varsha, (Amogha-Varsha).
7 Akála Varsha.	7 Akála Varsha.
8 Indra Rája, (his grandson).	8 Jagat Rudra.
9 Amogha Varsha II.	9 Indra Nripa.
10 Govinda Rája, (his brother).	10 Jagat Rudra.
11 Baddiga, (his paternal uncle).	11 Amogha Varsha.
12 Krishna Rája, (his son).	12 Krishna Déva.
13 Khotika, (his brother).	13 Khodviga Déva.
14 Kákala, (his brother's son).	14 Kákala Rája.

6. The first seven names in both lists are no doubt the same. The change of the first into Nandi Durga, and of the 6th prince into Madanogha Varsha, are mere errors of the translator, and not supported by the original Sanscrit. The eighth prince is called Jagat Rudra by Mr. Wathen, while his name in the accompanying grant is Indra Nripa. On referring to the original Sanscrit of the Kardla plate, it appears that Jagat Rudra is not mentioned there as a descendant of the Yádava family, but is introduced as the father of Indra Rája ; who being, according to the enclosed grant, a *daughter's* son of Akála Varsha, there is nothing contradictory

in supposing him to be the son of Jagat Rudra. But Indra Rája's mother is described in the Kardla grant as the daughter of his uncle Shankara Gana, king of Chedi, and not of Akála Varsha. The easiest way of accounting for the discrepancy, however, appears to me to suppose that the name of नप्ता (daughter's son,) is applied in the accompanying inscription to a son of Akála Varsha's son-in-law, not born from his daughter, but from a different wife. This supposition is fully warranted by the common use of that word.

7, The 10th prince, Jagat Rudra II of Mr. Wathen, appears to be the same as the first prince of that name; and the 11th Amogha Varsha is another son of his, born from Govindava, another daughter of his uncle and father-in-law, Shankara Gana of Chedi; so that he is a half-brother of Indra Nripa. Whether he was a brother of this last prince, or his son, as stated in the accompanying inscription, we have no difficulty in identifying him with Amogha Varsha II in my list. Govind Rája, the 10th, is a brother of this last named ruler, and the next Baddiga is a paternal uncle of Govind, and, consequently, another brother of Amogha Varsha. Both these names are omitted in the Kardla plate.

8. Some difficulty now presents itself with regard to the 12th and 13th princes in my list—the two sons of Baddiga. Though both these names are to be found in the Kardla grant, yet we have the following account of their connection with Amogha Varsha. "His elder brother, Shri-Krishna Rája-Déva, having left this earth to seize Indra's kingdom, Khodviga Déva, the son of Amogha Varsha, and Kandaka Dévi, the daughter of Yuva Rája, succeeded: a most renowned prince."* The apparent inconsistency between the two plates is satisfactorily explained by supposing that Krishna Rája only was the son of Baddiga; and Khodviga, described as his भ्राता (brother) was his cousin, and the son of Amogha Varsha born as mentioned above. There can be no hesitation in admitting this, when it is recollected that भ्राता is used not only for paternal cousins, but for more distant relations.

9. This view of the subject derives some support from the opinion of Prof. H. Wilson, of Oxford, who makes the following remarks on Mr. Wathen's genealogy of the Yádavas.—(p. 393 No. IV. Asiatic Jour.)

10. "It is probable that two collateral branches (of the Yádavas)

* See p. 102. No. V. Asiatic Society's Journal, March 1836.

are described, the junior of which intermarried with the Ráshtra Kuta princes of Chedi, and exercised an authority, nominally at least, subordinate to the other. Akála Varsha and Amogha Varsha, the last of either series, seem to be contemporaries; and that the latter notwithstanding his lofty titles, was inferior to the former, is implied in the expression, "Meditating on his feet," (Shrimad Akála Varsha Pádánudhyáta,) as one of the titles of Amogha Varsha." The modification that I suggest in this theory, is to suppose that Jagat Rudra did not belong to the Yádava family, that his name is introduced in the Kardla plate to connect the descent of Indra Rája and Amogha Varsha II from Akála Varsha; and that the former, instead of being contemporary with the latter, was his grandson, who might, without any contradiction, be described as meditating on the feet of his ancestor, Akála Varsha.

11. According to this hypothesis, the names in the accompanying grant may thus be connected with Mr. Wathen's list.

1 Danti Durga.
2 Krishna Rája, (his paternal uncle).
3 Govind Rája, (his son).
4 Nirupama, (his younger brother).
5 Jagat Tung or Jugat Rudra, (his son).
6 Amogha Varsha, (his son).
7 Akála Varsha, (his son).
8 Jagat Rudra, (his son-in-law).
9 Indra Nripa, (his son).
10 Amogha Varsha II, (his son or brother).
11 Govind Rája, (his brother).
12 Baddiga, (his paternal uncle, and brother to Amogha Varsha).
13 Krishna Rája, (his son).
14 Khotika or Khodviga, (cousin of Krishna Rao, and son of Amogha Varsha II).
15 Kákala, (his nephew).

It is with great diffidence that I offer the preceding remarks, the truth of which can be established or disproved only by future discoveries. It is probable that the writer of the accompanying inscription was not rightly informed of the pedigree of the enemies of his lord paramount, the Chalukya king Satya Shri.

12. The era of Krishna Rája and Govind Rája, the second and third in the above list, is furnished in a copper-plate, found at Van-Daidori, in the district of Nassic, by L. R. Reid, Esq., and published in No. X. of the Asiatic Society's Journal. According to this document, Govind Rája was on the throne in 730 Shaka (A. D. 808), and in the Kardla inscription, the date of Kákala's reign is Shaka 894 (A. D. 973); so that placing this last prince's accession about ten years before this time, or in Shaka year 884, and making a deduction of two princes, who, being introduced merely to explain the descent of Kákala, never ascended the throne, in all probability, we have between Govind and Kákala, ten princes, whose reigns extend over a period of 154 years; giving 15.4 years for the duration of each reign, which does not much exceed the ordinary average.

13. The capital of these Yádava princes of Ráshtra Kuta, is described in the Kardla grant as Mandya Khéta, which Mr Wathen supposes to be the same as Man-Khéra in the dominions of the Nizam of Hyderabad. No grants by this dynasty have been as yet found in the collections made by the late Col. McKenzie.

14. I now come to the family of the donor, Rahu Rája. The fact of its having been descended from the kings of Ceylon is remarkable on more than one account. The only interesting circumstances mentioned about this chief are, that the authority of his family extended from the Ghauts to the sea, and that one of them, Avasara, lent his aid to the ruler of Chandra Míla, which Mr. Wathen conjectures to be Tanjore, from its native name of Chandáwar.

15. The names of the princes of this family are as follows.

1	Jhalla Phulla.	6	Avasara II.
2	Dharma.	7	Indra Rája.
3	Diyapa Rája.	8	Bhima.
4	Avasara.	9	Avasara. III.
5	Aditya Varma.	10	Rahu, (the Donor).

Of these the first is stated to have enjoyed the favour of Krishna Rája (the first) of the Yádava race, who reigned in the beginning of the 8th century of Shálivahan, as shewn above; so that we have ten of these petty princes reigning over a period of 200 years (or between 730 and 930 of Shálivahan). This gives an average of 20 years to each prince; and

it does not appear much beyond probability, when it is considered that the situation of the Conkan being far from attractive to invaders, it has ever been more tranquil than any other part of the country.

16. All the three villages described in the accompanying inscription, are given in perpetuity, to a family of Brahmans of the Matta Mayura race, having the surname of Karkaroli. They all appear to be situated in the district of Viziadūrga. Shantashmandi, the first, must obviously have been situated between the villages of Bápardé, Manché and Sávadalé; the two last of which, as stated in the grant, are on the banks of the river. The sites of the other two villages cannot be so easily made out, though there are places in the district, having the names of Gavána and Savadalé, mentioned in the grant as boundaries.

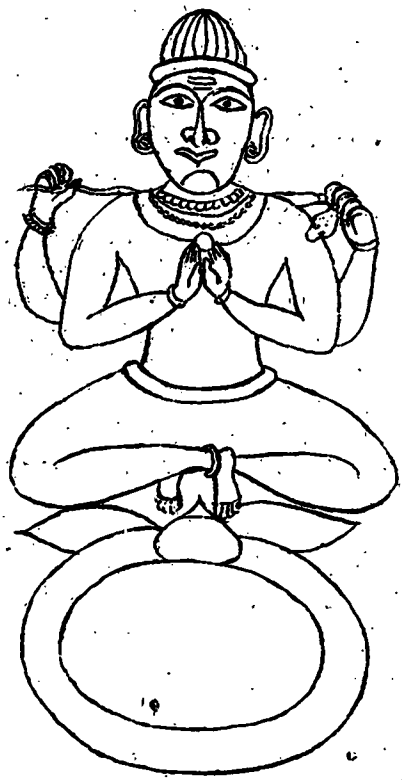
17. The language of the inscriptions has nothing remarkable in it. The character does not differ much from the modern Balbodh; and the only letters belonging to the cave Alphabet that I find are ऊ for ई; ∝ for न; ∞ for ष; ५ for ध; and perhaps one or two others.

I remain, dear Sir,
Yours most sincerely,
BALL GANGADAR SHASTREE.

21st November, 1842.

To The Rev. John Wilson, D. D.
President of the Bombay Branch of the Royal Asiatic Society.

Ring connecting the Plates, with the image appended to it.



Fac-simile of the Copper Plate

८० ॐ नमः सिवाय ॥ हेलोल्लालितचलुदलुचन लांगुष्ठायरा गा
हतस्वर्गं । गाढ्तसुक्रिसं पुटगलचुक्काकतंतालुवेर पालिवीक्रकया
लमास्य धजटाचछ्रास्तोलीवितंकं का लंचयदछुतेस्मितमचलीसकृद्द
स्विनम्रना गोत्रंकिञ्चाढ्रतोकुमधुपवसंतिकोसदाधर्मेवक्रीडाक्रोद्
लुकोह्यामयचपवंकाकंम्भितो माक्रहीकःश्रकावस्माकीतमूलःप्रकृतिन
तिप्पकोदानलेदृष्टः॥सा प्राघोस्मीहवं। गायदुकुलतिलकोनाषूक्रटेस्व
नालोनाशस्त्रीदृष्टिदुग्नेःप्रकृतपियतृनः कृष्णराजःपितथुस्तस्मो। द्वावि
दूराजस्यमकुकिंचुपामाऽस्माकुगडुंगदेवः॥तचुत्रोमाप्यवर्षोनिपुवकद
हकोऽस्णप्यथाकालवार्ष्याऽप्राप्यस्त्रीदुराजोतुविनतनवपुस्नुतोमाप्यव
र्षेशःसंगानन्यकिंवाश्रोवसमूव द्वनवत्वसमहपृतःहनिनिव
तस्यकर्कीयाश्रुतागोविन्दराजोऽ तनापितृष्यस्यस्त्रीश्रलयज

नताकल्यविटयीहतांतोगतीकांक्षय गुल्किविर्व्वेदिराहयः। प्रतिहुरुः
यात्काकूतयुगाहपालांकलियुगेयदा यातःस्वोबुकिनिवजगतु तदयः॥
संकोषडाकऊ वाहिमुडेनिवेकृतामोय थादस्तनथस्यहानक्रयकृः। तस्यत्वजो
पियातुनंवुविनेग्वलायाकरीकुवःसमरुवदुयिहूभूराजः॥सोनंकित्वामलुलं
यागदहृणयातेतस्मिन्नेवसभायकासमातम्फुतास्योरिकाग्यस्तोऽहृदृष्टीहलो
गगकागोर्हितस्त्रीः॥ कृकालदलकात्वेकुवोरुर्जऊप्रियः।भामीच्चयलुकनेव
प्रतापजितसाचयः॥समतेतंविनिर्द्धिस्तिलपोऽकुमहीयनिःयालुकाकूयद्वा॥
जिचुनचानिगजकेस्तरी॥तस्यत्वजंःयचंजिघ्नुःस्णतःस्तणस्त्रयो रुवताक्षि
तीस्वरःसस्वष्टद्विर्विकोमेकत्वसोर्हितः॥पयंप्रवईमानयालुकाकूयग्रीस्तणप्र
यवाजेवरूपाटीभूकुस्तासति॥७॥आसीद्विगयरावीसोगरुलुदकजीपितृः
जीवूतकेतोःसपुत्रोकाम्बाजीमूतयाहऊः॥ततःसिलायंसोऽस्थिहलत्मारू
तांयवधप्रकृतस्कृतमोक्षाग्रहाग्रवाकूर्द्धितार्द्धितः॥मास्मालल फुल्लःग्व्यातः
तघ्नराजप्रसादयाऽसमुद्रतीरस्थकूदस्तस्यावोरू वत्॥तत्पुत्रोवभ्रु·

ष्ण गृह्णा ग्रावस्थिय वः पवः। प्रतापवा का हाडुग्ने यलि थग्र व त्त क्रती ॥ त स्मादे.
यप वाजो कृ द्वि जि मी षुगु ल्लाञ्चित श्मा त एयडु पु रास्म मू कालिवा वास्तु वास घः ग
वकृ वा वय त स्मृ स्मा रीति स्ताघ्रार्थ्य तन्व विद्या क मेत्र प्रलग्नाति कालु स्व लु प्रा क्रमश्च।
आदित्यवर्म्मा पु रो सुत्रेऽ या दित्यव त्र तः। त स्मा दयु स। राजा ता जि तारिर्द्द र्म्म वाक्ष पश्च।
येऽ त्र नाग ब्रु पु त्र जस्त्रा य स्त्रा हाय्य मदा ग्राः न तो रु व दिन्दु राजा ग्रण गस्रो गा ति यु
३ र्व गात स्त्रा ग्र्र कृत स्त्रा ग्रण कृद्धी मा द्री मा रू वि क्र मश्च ते जा मा हु व ब्रु म्न चन्द्र म लु ल
उ कृ तः॥ त त स्त्रा व स्त्रा मा राजा जा ता तीव वि वे क वाग्। प्रा ङुः प्रा ङु ऊ नावा ग्तः
ब्रु वः यू यम कृ प वाकृ ग्र रू का मारू य क स्मा द्रा जो पु ल्व गौ व वः श्रीति ङो मीति
सा ग्रा घे ब्रु से बी जि ति कि यग्र। प च मक हा यक म हा वाजा वि वाज मी स्त ण स्त्र यदे
याकु ग्री तम ङ ल्लि कस्री व हु राज ः स्त्र घो का व स्त्र तं व ग्र। मा क ग्पो व जो क य द्र प क्र
का मा ल्व र्म्म माहु या स्तु वः स्त्र विदि तं य था कू ल्लीक ऊ रा प्र त दा व ब्रु ग्रा सं। योय
कं ङि प यु प त कृ मि वे ष्ट्र वि योग ऊः ग्यं ण वि ऊ वा म च ल स्ता क च लै य
स्त्री व कं प व कं च ल क म ल दृ ल वा त जा ल ल व स्त्र मी च का यु षी

प्रादुर्द्धाद्रेयोकुपालकमभ्यर्च्यं भिंकाविकः पार्थिवश्रेष्ठयोकृयाया
वात्तामकृद्यः सामान्योयंधर्म्मासे उकृपालोकालेकालेपालनीयोकृवद्भिः।
यस्त्वेवमर्थितापिकलिकालमुपितमुक्तः पुनातुवर्म्मदायन्तुपिंकनिष्ठति
स्मर्वंकिंचयपालमकुरुविष्ठितिउक्तंचस्वदत्तांपरदत्तांवायोहरेतवसुंधरा
मांषष्टिवर्षसहस्राणिविष्ठायांजायतेकृमिर्भूत्वाषष्टिवर्षसहस्राण्यस्वर्गेतिष्ठ
४ तिकृमिदंशआहेत्यत्रवाकुमत्रायताऽवकंनकंब्रजेतांऽतिमद्विवसमवक
र्यसमस्तागामिनृपतिभिःपालनधर्म्मेपरलोकफलकांक्षिभिरेषकरुणीयःकपुन
स्त्वलोपकलकृपानिर्दुवितव्यमायथावितादृवंस्त्रीनहूनाजस्वहस्वस्वहस्व
मात्रोपयतिस्वहस्तोयंममस्त्रीनहनाजस्यनमुद्रासुदुंक्रियासुदुंकुक्ति
सुदुंमविकृकमथनाजस्वहस्तसुदुंतुसुद्विमायातिसासनकम्।।७०
सिवमसु।।संविविग्रहिकस्त्रीदेवपालसुतेनलोकपार्यनाम्नालिखित

शिवम्।।

Transcript of the Plate in Balbodh.

नमः शिवाय ॥ हेलोल्लालितचंडदंडचरणांगुष्ठाग्रभागाहतस्वर्गांगो
द्वतशुक्तिसंपुटगलन्मुक्ताभृतंतांडवे ॥ पाणौवीक्ष्यकपालमाश्वथजटाचं-
द्रामृतोज्जीवितंकंकालंचयदभ्दुतंस्मितमवत्वीशेनतद्वश्चिरं ॥१॥ गोत्रं
भित्वानभूतोनमधुपवसतिर्नोसदाधर्मवक्रोनाक्रांतोदंडकोल्यानचपरपवना-
कंपितोनांतहीनः ॥ नाधस्तान्नीतमूलः प्रकृतिरतिघनानोरणेदत्तपृष्ठः
सोत्यर्थोस्तीहवंशोयदुकुलतिलकोराष्ट्रकूटेश्वराणां ॥२॥ तत्रासीद्दंतिदु
र्गःप्रभुरपिचततःकृष्णराजःपितृव्यस्तस्माद्गोविंदराजस्तमनुनिरूपमोस्मा
ज्जगतुंगदेवः ॥ तत्पुत्रोमोघवर्ष्योरिपुवनदहनोस्याप्यथाकालवर्ष्योनप्रास्य
श्रींद्वराजोरुचिरतरवपुस्तत्सुतोमोघवर्ष्यः ॥३॥ शृंगाररससनिवासोव
संतवद्वरवधूसमूहवृतः ॥ हरिरिवतस्यकनीयान्भ्रातागोविंदराजोभूत्॥४॥
पितृव्यस्तस्यासीत्प्रणयजनताकल्पविटपीकृतांतोरातीनांनयगुणनिधिर्बहि
र्गनृपः ॥ प्रतिच्छेदःसाक्षात्कृतयुगनृपाणांकलियुगेसदाचारःशांतो
मुनिरिवजगत्तुंगतनयः ॥५॥ शंभोःषडाननइवात्रिमुनेरिवेंदूरामोयथा-
दशरथस्यहरेर्ज्जयंतः ॥ तस्यासजोपिचतुरंबुधिमेखलायाभर्त्ताभुवःसमभ
वद्विकृष्णराजः ॥६॥ सोयंक्षित्यामंडलंयोगदृष्ट्यायातेतस्मिंश्चैवसद्मावका-
शं ॥ तस्यभ्रातायोटिकाख्यस्ततोभूत्पृथ्वीभर्त्तात्यागकामोर्जितश्रीः
॥७॥ ककलस्तस्यभ्रातृव्योभुवोभर्त्ताजनप्रियः ॥ आसीत्प्रचंडधामेवप्रताप
जितशात्रवः ॥८॥ समरेतंविनिर्जित्यतैलपोभून्महीपतिः ॥ चालुक्य-
नृपभ्राजिष्णुययातिराजकेसरी ॥९॥ तस्यात्मजःपरंजिष्णुःख्यातःसत्या-
श्रयोभवत् ॥ क्षितीश्वरःसत्यवृत्तिविक्रमैकरसोर्जितः ॥१०॥ एवंप्रवर्ध-
मानचालुक्यान्वयश्रीसत्याश्रयराजेशेभूपाटीमनुशासति ॥ ॥ आसीद्वि-
द्याधराधीशोगरुत्मदनुजीवितः ॥ जीमूतकेतोःसत्पुत्रोनाम्नाजीमूतवाह-
नः ॥ ततःसिलारवंशोभूत्सिंहलक्ष्माभृतांवरः॥ प्रभूतभूतसौभाग्यभाग्यवानू
जितोर्जितः ॥ नाम्नाझलफुल्लःख्यातःकृष्णराजप्रसादवान्॥ समुद्रतीरसह्या
तदेशसंभावनोभवत्॥ तत्पुत्रोधर्मएवाभून्नाम्नाधर्मयशःपरः । प्रतापवान्महादु-
र्गावलिपत्तनकृत्कृती । तस्मात्दैयपराजोभूद्विजिगीषुगुणान्वितः ॥ स्ना-
तस्यनूपुरासन्ननालिकेराम्बुनासयः ॥ बभूवावसरस्तस्मान्नीतिशास्त्रार्थतत्व

वित् ॥ चक्रमेत्रप्रलग्नारिकाण्डश्चण्डपराक्रमः ।आदित्यवर्मापुत्रोभूत्तेजसा-
दित्यवत्ततः । तस्मादवसरोजातोजितारिर्धर्मवान्नृपः । येत्रत्यचन्द्रपुरजक्ष्मा
भृत्साहाय्यमदाद्यः.।ततोभवदिन्द्रराजोत्यागभोगातिभुग्वरः ॥ तस्मात्प्रभूत-
भाग्योभूद्भीमोभीमाभविक्रमः। तेजसाराहुवद्ग्रस्तचन्द्रमण्डलउज्वलः।तत
श्चावसरोराजाजातोतीवविवेकवान् । प्राज्ञःप्राज्ञजनावासःशूरःपरमरूपवा-
न् । रहुनामाभवत्तस्माद्राजापुण्यभृतांवरः । नीतिज्ञोनीतिशास्त्रार्थवृत्यसे-
वीजितेंद्रियः ॥ परमरुद्वारकमहाराजाधिराजश्रीसत्याश्रयदेवानुध्यातम-
ण्डलिकश्रीरहुराजःसर्वमेत्रस्वसंवर्ध्यमानपौरजानपदप्रधानामात्यवर्गमाहू -
यास्तुवःसंविदितं॥यथांतलीनजरापूतनाचर्व्वयासंयौवनंनिरयपतनमिवेष्टवि
योगदुःखंभाविजरामरणशोकरणंचशरीरकंपवनचलकमलदलगतजलल
वसदृशीधनायुषीमत्वादानपरलक्ष्यविवेकबुध्या ।उक्तंचमुनिभिःअमेरपत्यं-
प्रथमंसुवर्णंद्यौर्वैर्ण्वीसूर्यसुताश्चगावः। लोकत्रयंतेनभवेत्प्रदत्तंयःकांचनंगां
चमहींचददात् ॥ इतिमुनिवचनमवधार्यपित्रोरुद्देशेनात्मनश्चश्रेयसेशकनृ-
पकालातीतसम्वत्सरनवशतेषुत्रिंशदधिकेषुप्रवर्त्तमानकीलकसम्वत्सरांतर्ग-
तज्येष्ठपौर्णमास्यांश्रीमदर्घेश्वरदेवपञ्चोपचारपूजापुरस्सरखण्डस्फुरोटितसं
स्कारार्घ्यसत्तपस्विभोजनाच्छादनच्छात्रविद्वज्जनाद्यागतादुपयोगार्थं-
शान्तष्माण्डीग्रामस्तस्याघट्टनानिकथ्यन्ते । पूर्व्वतोमणिग्रामप्रपा । दक्षि-
णतोवापरवटग्राममार्गः । पश्चिमतःसवान्दलकपितृग्रामवाहला । उत्तरतः
क्षारनदी ॥४॥ तथासनवीरग्रामस्तस्यपूर्वतोझरवाहला । दक्षिणतःका-
रपण्डीग्रामनदी । पश्चिमतःसमुद्रः । उत्तरतोगवहणग्रामनदी । तथावड-
द्रुलग्रामस्तस्यपूर्वतोभोगदेवपर्वतयमलप्रस्तरोदक्षिणतोग्वडदवाहला । प-
श्चिमतःपटसडपाषाणः । उत्तरस्तामानग्रामसीमवीपर्वतः ।४। तथादेव-
लक्ष्मीग्रामेजीवलोकः ।१। व्यूढरूलेचाकान्तरः ।१। शय्यापल्लयांदूहकः
।१। तदेतद्ग्रामत्रयादिकंचतुराघाटविछिन्नंसर्वराजकीयायाद्यंतरमचाट
भटप्रवेशपूर्वदत्तदेवदायब्रह्मदायवर्ज्यंश्रीमत्तमयूरान्वयकर्करोलीसंततिप्रसू
तविद्वद्ब्रह्मचर्याचार्यभोग्यमाचंद्रार्कंपालनीयं ॥ श्रीमन्मत्तमयूरान्वयांतर्ग-
तकर्करोलीसंतानगुरुक्रमायातसिद्धांततत्त्वार्कापहृतमोहांधतमसानांतपो-

महिमप्रध्वस्ताशेषशंकानांप्रबोधप्रदीपप्रकाशितस्वर्गापवर्गमार्गाणांसभाविजयलब्धत्रिभुवनकीर्त्तीनांश्रीमदंभोजशंभुगुरूणांचरणकमलांतर्लीनमधुलिड्भ्यःश्रीमदात्रेयविद्वद्वरुभ्योविद्यादानस्वरूपेणसमदात्॥ तथाद्वीपांतरायातवहित्रास्वर्णवदिवाणं ।१। चेमूल्यचंदपुरवर्ज्यकंदळमूलीयायातस्वर्णधरणं ॥ दारिकाकुटुंबानिचतैलिककुटुंबमेकं ।१। मालाकारकुटुंबं ।१। कुंभकारकुटुंबं ॥१॥ रजककुटुंबं ॥१॥ दुर्गाद्यंतरेचजगतीपुरार्धभूमिं तस्याश्चाप्याघट्टनानिकथ्यंते । पूर्वतोवसंतिप्राकारोदक्षिणतोमर्कटेगोपुरंपश्चिमतःसीवटमार्गउत्तरतोमार्गकूपः॥दुर्गाद्बहिश्चपुष्पवाट्यर्धंपूर्वप्रसिद्धवडवाभुवं । तदिदंधर्ममाप्रकीर्नमामकीनैर्भाविभिर्नरेंद्रैरनुपालनीयमुक्तंचमुनिभिः ॥ यानीहदत्तानिपुरानरेंद्रैर्दानानिधर्मार्थयशस्कराणि । निर्माल्यवांतप्रतिमानितानिकोनामसाधुःपुनराददीत ॥ बहुभिर्वसुधाभुक्ताराजभिःसगरादिभिः । यस्ययस्ययदाभूमिस्तस्यतस्यतदाफलं ॥ सद्योदानंनिरायासंसायासंदीर्घपालनं । अतएवर्षयःप्राहुर्दानाच्छ्रेयोनुपालनं ॥ दत्वाभूमिंभाविनःपार्थिवेंद्रान्भूयोभूयोयाचतेरामचंद्रः ॥ सामान्योयंधर्मसेतुर्नृपाणांकालेकालेपालनीयोभवद्भिः । यस्त्वेवमभ्यर्थितोपिकलिकालमुषितमनस्कःपुरातनधर्मदायलुप्तिंकरिष्यतिसएवनिरयफलमनुभविष्यति । उक्तंच । स्वदत्तांपरदत्तांवायोहरेतवसुंधरां ॥ षष्टिर्वर्षसहस्राणिविष्ठायांसकृमिर्भवेत् ॥ षष्टिर्वर्षसहस्राणिस्वर्गेतिष्ठतिभूमिदः । आछेत्ताचानुमंताचतान्येवनरकंव्रजेत् । इतिमुनिवचनान्यवधार्यसमस्तागामिनृपतिभिःपालनधर्मएललोभएवकरणीयः । नपुनस्तल्लोपकलहपरैर्भवितव्यं । यथाचेत्तद्देयंश्रीरहुराजःस्वहस्तेस्वहस्तमारोपयतिस्वहस्तोयंममश्रीरहुरायस्य । मुद्राशुत्धंक्रियाशुत्धंभुक्तिशुत्धंसचिन्हकं । राजस्वहस्तशुत्धंतुशुत्धिमायातिशासनं ॥ ७ शिवमस्तु ॥ सांधिविग्राहिकश्रीदेवपालसुतेनलोकपार्थेनाम्नालिखितमिदं ॥

Translation of a Copper-plate Grant, found at Kharepatana on the Viziadurga river, bearing 930 *Shaka year* (*or* 1008 *A. D.*).

Invocation to Shiva. May we ever receive protection from that merry humour of Shiva; who wonderfully smiled, when he saw the skull in his hand filled with the pearls which had been scattered from the shells of the heavenly river, trodden by the extremities of the toes of his feet, while his post-like legs were lifted up and down in dancing; and when he perceived the same skull immediately converted into a living skeleton by the immortalizing nectar of the moon contained in his clotted hair. There is a race (vunsha) of the lords of Ráshtra Kuta ornament to the family of Yaadus; which, (unlike the other vunsha or bamboo) has issued without injuring its * ancestors; which admits of no drunkards; is never cross in a charitable deed; is never bent under the burden of tribute; and is never shaken by gale-like enemies. Its roots do not descend to low places, nor does it turn its back in battle, its texture being solid. King Danti Durga of this race was succeeded by his paternal uncle Krishna Rája; who was followed by Govinda Rája, after whom flourished his younger brother Nirupama. This prince was succeeded by Jagat Tunga. Amogha Varsha his son, was to his enemies what fire is to a forest. His son Aká-la Varsha was followed by his comely grandson, Shri Indra Raja, and from him was born Amogha Varsha. His younger brother Govinda Rája, was, like Hari, an asylum to the feeling of love, and surrounded by crowds of young damsels like the spring. His paternal uncle Baddiga, the son of Jagat Tunga, became a desire-yielding tree to his supplicants, while he was a second Pluto to his enemies. He was, in point of virtuous deeds, an image, in Kali Yuga, of the kings of Krita Yuga, and was as mild as a Muni. As six-headed god to Shumbhu, as moon to Atri Muni, and as Ráma to Dasharatha, so was his son Khrishna Rája to himself. After this king left this earth by means of Yoga, (?) his brother Khotika, (or

* Here is a play of words, founded upon the two meanings of "vunsha," which cannot be translated. The sense of the words employed is given above, as intended to be understood in reference to the royal race. In connection with the bamboo, with which the royal race is contrasted, the words used namely गोत्र, मधुप, धर्म and दण्ड, mean a hill, a black-bee, nature, and a club, instead of ancestors, drunkards, charitable deeds and tribute. The rest of the allusion may be easily understood.

Gyotika) who acquired glory with a wish of displaying generosity, ruled the earth. His brother's son Kákala, was a popular king, who had defeated all the enemies by his prowess. Having defeated this king in battle, the lion-like and glorious king Teilapa, of the Chálukya race, descended from Yayati, came to the throne. His son Satyáshraya, renowned as a warrior by his exploits, became after him the master of the earth, and governed it with equity. While this Satyáshraya, lord of kings, descended from the flourishing race of Chálukyas, was ruling over the surface of the earth, (his tributary Rahu Rája was master of the Conkan, whose pedigree is as follows). The Shilara race of the king of Singala (Ceylon,) derives its origin from Jímít Váhana, the son of Jímúta Ketu, the lord of the Vidya Dharás, who was preserved by the celestial Garúd (the eagle of Vishnú). In this race was born Jhala Phalla, mighty in deeds, but handsome in person, who under the favour of Khrishna Rája (of the Yádava race mentioned above), governed the tract of country between the sea and the Sahya mountains. His son Dharma, as his name implies, was bent upon acquiring fame by virtuous actions, and had distinguished himself for valour as well as for the foundation of towns and the construction of forts. From him was born Diyapa Rája, who was possessed of all the qualities of a conqueror; and to him, after he bathed himself in the water of the cocoanut fruit, was born Avasara, who comprehended the doctrines of morality, and was celebrated for his grand exploits. His son A'ditya Varma resembled A'ditya (the sun) by his glory; and from him descended the virtuous king Avasara, who defeated his enemies and aided the kings of Chandra Pura.* From him was born Indra Rája, who was as famous for his enjoyments as for his generosity. His fortunate son Bhíma, resembled Bhíma (the 3d of the Pandvas) in valour, and by his effulgent glory had eclipsed the splendour of Chundra Mundala, (the Court of Chundra Nagaru ?) as Rahú does that of the moon. From him was descended king Avasara, who was possessed of great prudence and wisdom, who afforded refuge to learned men, and was both handsome and brave. To him was born king Rahú, the chief of the virtuous men, who having made himself acquainted with morality, was assiduous in respecting those who had distinguished themselves for virtuous conduct, and in duly regulating his passions. This tributary king Shri Rahú Rája, meditating on the feet of the great

* This passage contains one or two verbal inaccuracies.

sovereign Satyáshraya, and assembling his chief ministers and the principal inhabitants of his capital, (commands, as follows). Be it known to you, that youth is a morsel, greedily swallowed by the beldame "old age;" that the grief from the separation of what is dear, is like the torments of hell; that body is constantly being solicited by old age and death; and that wealth and life are as transient as the drops of water on the leaf of a lotus plant tossed about by wind. Knowing this, as well as keeping in mind the virtuous effects of gifts, and considering the saying of the Muni, namely, "Gold is the first offspring of fire, land is the offspring of Vishnu, and cows are the offspring of the sun; and he, therefore, who gives away land, gold, and cows, gives away three worlds;—also keeping in view the good of our parents and of ourselves, and for the purpose of contributing to the Panchopachára worship of Shri Argheshwar, to the repairs of his temple, as well as the supply of food and clothing to good devout men, their disciples and learned men—we have given on the 15th of Jeshta in the Shaka or Shalivahan year Kilaka, 920 years having elapsed from the commencement of that era:—1st. The village Shanta Shmandí of which we mention the boundaries. To the east, the creek * of Manigam; to the west, the road leading to Báparavata; to the west, the torrent running through the burying-ground of Savandala; and to the north, the salt river. 2d The village of A'sana Vira; to the east of which is the Jhara torrent; to the south, the river of Karpandí; to the west, the sea; and to the north, the river of Gavahana. 3d. The village of Vadadgula; to the east of it lies the hill of Bhoga Deva and the double rock; to the south the torrent of Gwedada; to the west, the rock of Patsada; and to the north the boundary hill of Támana. Also 1st, Jívaloka in the village of Deva Lakshmi; 2d, Akantara in Vyadgarula, and Duhaka in Shaya Pallí. These three villages &c. bounded on four sides, and free from all royal taxes,

* The word, प्रपा of which this is a translation, properly means a booth erected for the distribution of water. But its Marathi synonyme पोई also means, in the provincial dialect of the Southern Conkan, a creek or inlet running towards a river; and as the language of the plate is far from pure, and contains more than one provincial term, I am disposed to think that the word is used in this latter sense. One great reason for this conjecture is, that booths for the distribution of water are as unknown as unnecessary in the Conkan; and that creeks are usually referred to as the boundaries of villages.

and from the ingress of the Government people and the military, shall be enjoyed, with the exception of any prior grants to gods and brahmans, by the learned and the pious descendants of the race of Matta Mayara, descended from Karkaroli. May this grant be protected as long as the sun and the moon exist. This is given to Atreya, the learned preceptor that gave us instruction, and was himself a black bee in the lotus-like feet of Shrímat Shambhu Guru, who had dispelled the mist of ignorance by the diffusion of the light of philosophy, handed down from preceptors to disciples in the enlightened race of Matta Mayara; had removed all objections by the power of his devotions; had illustrated the path of heaven and beatitude by the communication of spiritual knowledge; and had obtained, throughout the three worlds, the reputation of having conquered the assemblies of learned men. We have also given to them a golden vehicle, that has been received from a foreign island, and gold which may be produced from vegetables except in Chandapura.* We have also assigned to the said brahmans a family of slaves, or female public servants; a family of oil men; a family of potters; and a family of washermen;† and have likewise allotted to them half of the land of the Jagat Pura, of which the boundaries are as undermentioned:—To the east, the dwelling palace; to the south, the monkey gate; to the west, the road leading to Shévata; and to the north, the well on the public road. Out of the fort also we have granted the spot formerly known as the mare's ground, for making a garden. This grant of mine should be preserved by my posterity as well as other future kings. As Munís have said, "Grants assigned by former kings with a view to the promotion of virtue and the acquisition of fame, are like offerings once dedicated and become stale, or like matter ejected from the mouth. What good man will take them back? Many kings, as Sugara, &c. have enjoyed the sovereignty of this earth; to whomsoever the earth belongs, to him belongs the fruit thereof. It is not difficult to give once away, but it is very difficult to preserve a grant for a long time; for this reason the Rishis

* I am extremely doubtful about the correctness of this reading. After very attentive consideration, however, I was unable to give any other interpretation to the passage.

† These families were to enjoy their lands rent-free, and in return to serve the brahmans. The custom of making such assignments has existed under every native Government.

have said, that the preservation of a grant is a more pious act than the assignment of it. Rámchundra having given land, again and again solicits future kings: this is a common duty of rulers, and you should protect it from time to time. He, who, though thus entreated, will resume old grants, shall experience the torments of hell. It is further declared, that he who resumes a land given either by himself or by another, becomes a worm in filth for sixty thousand years. He who makes a grant of land, remains in heaven for sixty thousand years; he who resumes it or approves of its resumption, continues in hell for the same period."-Considering these sayings of the Munis, all future kings should covet the credit of having performed their duty of preservation. They should by no means eagerly quarrel for setting grants aside. We have set our hands, the own hands of Shri Rahú Rája to this. A grant is purified (ratified) when it is accompanied with seals, formalities, precedents, symbols, and the king's own hands. May there be prosperity.—Written by Lokapárya, son of Shri Déva Pála, employed in the negociation of war and peace.

ART. III.—*Climate of Karrack.*

Bushire, 14th October, 1842.

To the Secretary to the Literary Society, Bombay.

SIR,—Perhaps the accompanying notes of the range of the Thermomater at Karrack for April, May, June, July and August last, may be acceptable to the Society. They were kept by myself, and are not very neatly written out, but may nevertheless be interesting to any one who wishes to have a minute account of the climate of Karrack during the summer.

I may observe, that I have usually marked the hours of the day when Tatties were used. "No tatties" are registered at the usual Tatty hours when none were used, and when no mention is made of whether there were tatties or not, then there were none. In very hot winds, the difference produced on the Thermometer by the air passing through a good tatty was 12 or 14 degrees, generally the difference was only 8 or 10 degrees; and the difference between the temperature close to the tatty and removed seven feet from it, but opposite to it, in a spacious room was 3 degrees. In a corner of the room not in the direct line opposite to the tatty, the difference was 5 degrees.

As a general rule, when there was wind from any quarter whatever, the heat was bearable, and it was only during the calms accompanying the wind when it had veered to the east and south east, that the air was intolerable. As a general rule, there ought to be three places for sleeping. One a bed in a bedroom with a punkha hung to one of the cross sticks of it, to be used when there is not a breath of wind. One a bed on a terrace, either with or without a fly of a tent on it, for sleeping in when there are gentle or moderate winds from any direction; and one in a verandah facing the north-west to retire to when it blows a gale from the N. W., so as to be entirely fanned by the wind but so as not to be in a draft. In the same night according to the variations of the wind, one may be glad to resort to all three of these contrivances by turns, and so to obtain rest when others who have not made such preparations, pass a sleepless and restless night.

I send you also a memorandum given to me by Colonel Davies of the average range of the Thermometer at Karrack in 1841 during the summer months. The year 1842 was esteemed cooler than 1841; but the months of September and of October till now have been unusually oppressive. From the middle of November till the end May the climate is both agreeable and healthy, although sometimes about the middle of November fevers and colds are severe. This last piece of informatiou I received from Colonel Davies.

I remain Sir,
Your very obedient servant.
H. D. Robertson.

Thermometer at Karack.

	Highest.	Lowest.	Highest.	Lowest.	Highest.	Low.
January,...	61	49	February... 65	52	March... 69	56

	6. A.M.	2. P. M.	8. A.M.	Aver.	Winds.
January	66	59	67	57	
February	69	61	60	60	
March	65	67	66	66	
April 1st	63	69	64	65	N. W. strong.
2nd	65	68	65	65	,, light.
3rd	64	68	65	65½	,, moderate.

DATE.	6 A. M.	9 A. M.	12 A. M.	3 P. M.	8 P. M.	Average.	WINDS AND WEATHER.
4	64	65	66	68	65	65½	N. W. moderate gale.
5	65	67	69	72	70	68½	Do. calm; sun hot; evening, West.
6	67	68	71	71½	71	69½	South; warm; West in the evening.
7	65	69	72	72	71	70	S. Westerly; light air; West and N. W. evening.
8	64	71	73	74	72	71	West; mild; cloudy; evening a calm.
9	68	70	72	74	72	71	W. S. W. mild; clear sky; S. W.
10	65	72	73	75	73	71½	N. W. mild; calm 12; West 2 P. M. S. W.; strong.
11	67	72	74	75	74	72¼	Night, East, mild; noon, West, cloudy.
12	72	74	76	78	76	75	North-East; cloudy, relaxing; 12 N. W.; hottish wind.
13	74	76	77	78	76	76	N.W.; calm; more bracing; muschitos and flies very troublesome since the 8th; 12, S. W. squalls; clear weather; relaxing; night, South.
Average from first.	66½	69½	71	72½	68⅛	69	

	5	9	2	5	9	Average.	WINDS, &c.
14	70	76	81	80	78	77	Warm; South; calm 2 h.; S.W.; cloudy.
15	74	75	80	80	78	77½	Do. East; cloudy; 12 h. S. W. cool.
16	74	78	81	80	76	77¾	Do. S.W. calm, hazy; 12 N. W. 2 S. W.
17	74	77	80	79	74	77	N. E. heavy dew, cool; 11 S. W.; cool and pleasant.
18	72	77	80	79	75	77	W. heavy dew; calm 10; S. W.; pleasant.
19	70	75	78	77	75	75	South; heavy dew; cool; cloudy; delightful.
20	72	75	77	76	75	74¾	S. E. by E. strong wind; cloudy 3 h.; N W.
21	70	74	76	74	72	73	N. W. gale; moderate at 3 P. M.; cold.
22	68	75	78	75	73	74	N.W. cold; delightful; 10 h. strong wind.
23	68	74	78	76	75	74	W. N. W. calm; 11 h. East; cloudy, drops of rain W.
24	74	77	81	79	75	77	W. N. W. calm; 9 h. N. E. cloudy, 2 h. W.
25	74	77	82	82	80	80	N. 12 h. N. E. 3 h. S. W. pleasant.
26	76	78	86	82	81	80½	N. and N. W. 4 h. S. W. hottish wind.
27	78	82	83	81	79	80½	S. strong; sun observed with dust; muggy, 4 h. West.
28	75	81	85	83	78	80½	W. W. calm 3 h. strong from N. W.
29	75	79	82	80	75	80	Strong N. W. all day; delightfully cool.
30	75	77	84	82	81	80	N.W. moderate; cool; strong in afternoon.
Average.	73½	77	79¾	79	79½	77⅛	
Average from first.	07	73½	76	75½	74	73¼	

MAY.

Date	Sunfire	9 A. M.	2 P. M.	5 P. M.	9 P. M.	Average.	WIND AND WEATHER.
1	80	81	85	84	82	82	Strong; N. Wester; hottish.
2	80	82	86	83	80	82	Do. do. do.
3	77	80	86	82	78	80	Do. do. very cool.
4	76	78	83	81	78	79	do. do. very cool.
5	73	74	76	74	73	74	do. do. evening very cool.
6	72	74	78	76	75	75	do. do. moderate 4 h. S.W.
7	68	72	78	75	74	73	Calm, S.W. 1 h. S.W. heavy dew.
8	71	74	82	80	78	77	Calm; W.S.W.; warm.
9	74	76	80	80	78	77½	Ship. Calm; W.S.W.; went to Bushire.
10	76	78	82	08	78	79	Bushire. Calm; W.S.W.; 3 h. arrived.
11	75	80	83	83	81	80½	Bushire. Calm; East. 10 h; S. W. strong breeze.
12	78	80	84	85	84	82	Ship. Variable and calms; heavy dew.
13	79	82	80	80	80	80	Ship. Karrack; warm N.W.
14	80	82	83	82	80	81½	Do. Strong N W.
15	80	82	84	83	82	82	do. do. do. moderate.
16	82	84	85	86	84	84	Light and variable; tatties.
17	80	83	84	84	82	82½	N.W. fog and dust; hot wind.
18	80	82	84	86	84	83	Do. moderate; very hot wind.
19	81	83	84	86	89	85	Calm; N.E. no wind; relaxing.
20	84	79	80	82	84	82	NW. moderate; evening, strong, pleasant.
21	82	83	82	82	85	83	W.N.W.; cool, gentle, breeze.
22	84	84	82	82	86	83½	N. Wester; hottish wind after 5 P. M.
23	83	84	82	83	86	83½	N West; calms; southerly after 5.
24	82	83	82	82	86	83	Slept on terrace first time. South-west and S. East; hot wind; from 5 P. M. calm.
25	82	83	82	82	85	83	Pitched but on terrace, calm. S. E.
26	83	83	83	83	85	83½	S. W., N., E. South; and S. W. S. W. calm; N. W.
27	84	83	83	83	86	84½	Tatties. N. W. calm; 10 h. N. W. 7 h. West; hot wind till 11 P. M. The wind always hottish from 6 to 10 P.M.
28	86	84	84	84	86	85	Gunfire at 4 h. 7′. sunrise at 5 h. 8′ wind N. W. moderate. Evening the great Shemaul or Northwest wind of 40 days set in at 5 P. M.

DATE	GUNFIRE.	9 A. M.	2 P. M.	5 P. M.	9 P. M.	Average.	WIND AND WEATHER.
29	86	84	84	84	86	85	Strong gale; hazy.
30	86	84	90	91	92	88½	Elphinstone. Bushire. Do. do. sailed ship for Bushire at 11 A.M. very high wind during the night, accompanied with sand
31	86	88	92	91	90	89½	No tatties. Do. do. high wind during the night. The wind at present coolest from 6 to 10 P. M. at Bushire on the edge of the sea.

Month of June 1842 *Karrack and Bushire.*

DAYS.	Gunfire.	9	2	5	9	Average.	WIND &c.
1	86	93	91	91	90	90	Strong N. West wind, very high during the night; moderate in the morning; Bushire.
2	87	93	91	91	90	90	Do. do. Do.
3	86	86	89	89	88	87½	Do. do. high all day; cooler.
4	84	85	86	86	84	85	Do. do. till 12, then moderate and clear weather.
5	84	86	87	88	84	86	Moderate N. Wester; sailed at 7 A. M. from Bushire. Moderate breeze all day; arrived at Karrack at 6 A. M.
6	82	83	83	84	83	83	Strong wind began again with alternate furious blasts of cold and hot; evening slightly hot.
7	82	83	84	84	83	83	Very strong N.W. wind with dust like yesterday; obscured by the dust; very cool.
8	82	83	83	83	83	83	Moderate N. W.; very cool; yet 5° difference with a tatty *and* without.
9	82	84	86	88	86	85	At midnight of 8th S. E.; morning S. W.; no tatties; noon West, 4 P. M. N.W. very light; hot day.
10 New Moon sprints.	82	88	88	86	86	86	S. W. by S. calm oppressive; 12 h. no tatties S. W. 4th W. cool.
11	82	86	88	88	88	86½	Tatties. S. E. 9 A. M. evening sailed for Bushire 12 h. S.W. no tatties; 4 h. West; all night calm.
12	84	88	83	83	85	85	Tatties. S. W. cool; 9 A. M. W. N W light wind; not very hot; 5 h. S. W. 7 h. N. E. calm.
13	83	84	83	84	84	83½	Tatties. W. N. W cool; 10 h. stronger, 4 h. strong N. W. hot wind; Cool wind after 5 P. M.
14	84	86	84	84	83	84	W. N. W. mild and calm; cool 12 h. hot wind light. 5 h. S.W. cool and delightful.
15	84	84	83	83	83	83	W. N. W. mild and cool; 4 P. M. S. W. very cool; 7 h. N.W. hottish, strong till 12 P. M.
16	84	84	84	84	86	84	N.W. fine cool breeze, veering to West; in the evening light breeze.
17	86	86	85	86	86	86	W. N. W. light breeze, very close and warm; night East for 2 hours and S. b.
18	87	88	89	89	88	88	W.N.W. calm; close and hot; 5 P.M. West; calm at 9 P.M quite in the last two nights very close. The morning delightful.

Days.	Gun fire.	9	2	5	9	Average.	Wind, &c.
19	89	90	87	79	80	8	N. W. calm till noon, then strong North-wester; very hot wind ; 12 degrees differ-ence of tatties.
20	83	88	80	86	87		No tatties. N. W. Cool delightful morning; breeze moderate all night and very light after 1 P. M.; hottish at 5 P. M.; wind S. E. & S. excessively warm; at 9½ P. M. breeze from Eastward but perspiration flowing in streams, although cooler at 12 P. M.; wind westerly.
21	86	87	88	89	90		Tatties. 4 A. M. to 3 P. M. N. E. very oppressive. When breeze at 11 cool ; 3 h. N. W. light very warm.
22	88	89	84	85	88		Tatties. At 6 P. M. 21st the S.E. set in *again* till 12 P. M. then the N. W. strong for 3 hours ; then calm and heavy dew; at 9 A. M. fine N. W. gentle breeze ; strong hot N. W. till 12 P. M.
23	Full	Moon					
24	86	86	84	83	86		Tatties. Strong N. Wester without change; not very hot yet 10° difference without & with a tatty, that is placi g the thermo-meter close to the tatty; at a distance 6° difference.
25	86	89	84	84	86		Tatties. N. W. all night and strong dur-ing the day ; delightfully agreeable all night.
26	85	87	85	85	86		Tatties. N. W. still fine breeze; cool all day and all night and very agreeable.
27	84	86	83	83	86		Tatties. N. W. still ; fine fresh breeze till evening when moderate ; all night plea-sant.
28	84	86	85	89	86		Tatties but *no* wind. *Calm* N. W. *light* breeze ; pleasant weather *till sunset* when wind changed to S. E. and contin-ued *till* 1 A.M. of the 28th; oppressively hot ; without wind.
29	84	86	89	88	86		*No* tatties. *Light* N. W. *from* 1 A. M. till 6 P. M. ; warm day & very oppressive night; wind variable from S. to S.E. and N. E. till 3 A. M. of the 29th.
30	85	86	88	88	86		At 3 A. M. N. W. pleasant morning —at 10 A. M. S. E. & South; very oppressive & warm all night while there was a cool-feeling breeze too from the South —The wind changed to N E. at 4 A.M.,at 8 S.E. again,and strong enough to feel cool. The air gives the sensation of being loaded with moisture, and from 5 to 8 A. M, there was a dense fog obscuring the sun but not resting on the surface of the earth. The wind kept at South and S. East the whole day and was cool to the feeling, although perspiration flowed profusely. It was at N. W. for half an hour at 2 P. M.

Full Moon springs.

9th, 10th, 11th, 12th, Southerly winds and oppressive.....	In June	In all 16 days
20th, 21st. & 22nd, Do. and Easterly; excessively oppressive.	11 days.	out of the 40 of
27th, 28th, 29th, 30th, Ditto do. do. do.	9 days	the Shimullawes
1st 2nd 3rd 4th and 5th July, Ditto do. do.	continuously.	24 for the N.W.

21st Winds very variable apparently inclining to N. W, during the day. South and S. E. from 6 to 12 P. M. Westerly till 5 A. M. then variable, then N. W.
22nd A few ripe figs from Shikh Nasin's garden.
24th White grapes within a few days of being ripe.
26th Apples and grapes from Bussora; plums, peaches and pears also on 21st June.

Eclipse of the Sun on 8 July } Friday. JULY 1842. New Moon 8d. 10h. Full Moon 22d.14h. 5′. } For Karrack.

	Days,	4	9	2	5	9	Average,	Winds &c.
	1	86	89	92	92	88		Still the Shurgee or South-East wind & excessively oppressive, although the wind is cool to the feelings; and the wind is strong occasionally; S. E. all night; till 5 A. M. at N. W. but calm; at 7 then S. and S. W. at 5 P. M. to 12 variable; very warm all night with little or *no* wind No tatties for 5 days now.
	2	84	86	88	92	88		
	3	86	88	96	94	89		Still S. E. and calm; excessively warm all day; evening strong S. W. cool breeze till 9 P. M. then change to N. W.; but calm all *night and very warm.*
	4	85	88	86	86	89		Tatties. At 5 A. M. wind at W. S. W.; calm till 1 P. M. then N. W. till 9 P. M.; hot wind till 10 P. M.
	5	85	89	86	86	92		Tatties. Hot wind; W. by S. at 5 A. M. W. N. W. at 8; 11 h. hot wind from N. W not oppressive; but hot except for an hour at evening. The wind was Westerly all *night.*
New Moon springs.	6	86	90	86	86	92		Tatties. Hot wind; wind W.N.W; delightful morning from 4 to 8 A. M.; at 9 hottish wind; pleasant day and also night; wind continuing a pleasant breeze from N. W. all night.
	7	85	92	86	86	90		Tatties. Delightful morning N. W. fine breeze; wind hottish all day; cool behind tatties; evening cool; strong N. Wester; continued cool gale all night.
	8	88	89	85	85	88		Tatties. *Delightful* gale from N. W. *all day and all night quite cool;* wind hot during the day but delightful by 6 P. M.
	9	86	88	85	85	89		Do. do. do. do. do.
	10	85	88	86	86	89		Tatties. Do. do. do. but much more moderate, Do. do. till 1½ A.M. when it fell calm and punka was required till 5 A. M. of the 11th to 16.
	11	84	88	85	85	88		Tatties. *Charming* morning; still and calm; wind N.W. (said to be the last breath of the Shimal for *this year*)—wind all day, a cool breeze at West and delightful evening till 12 P. M.
	12	85	88	86	85	88		Tatties. From 1 A. M. to 4; calm and oppressive (punka), then delightful morning; wind at West; gentle breeze at 1 P. M. strong wind N. W. again and hot; 96 without tatties.
	13	85	87	86	85	88		Tatties. The North Wester continued a fine cool breeze all last night (no punkha), and same all day to day.
	14	84	87	85	85	89		Tatties. *Still* the N. Wester all day and all night *excepting* for 3 hours; a S. E from 10½ P. M. to 1 A. M. when it was very warm; afterwards quite cool.
	15	88	92	86	86	92		Tatties. Delightful *morning* again; N Wester strong with dust; in the evening continued a fresh breeze; all night quite cool.
	16	85	87	82	84	90		Tatties. Delightful morning and N. Wester still continued all night, cool and *strong; from 28th June till now figs* every day.—The black came in to day.

Days.	4	9	2	5	9	Average.	Winds &c.
17	84	88	86	86	89		Tatties. N. W. fine breeze. Hajee Yacob says we shall have 14 days yet of this wind, then 7 days calm from sun rise to 11 A. M. thereafter West wind all day and all night. 44 days till Canopus rises and cool weather begins.
18	85	87	85	83	89		Tatties Do. do. with clouds till 9 A. M. quite cool outside; last night wind ceased for 2 hours from 12 to 2; cool all day; wind for 3 evenings always hot from 6 to 10.
19	87	88	86	87	90		Tatties. Wind hottish all night but not so as to prevent sleeping cool in it; very high at 12 P.M.; morning, charming breeze; cool; high wind all day; not hot, if out of the wind the heat is then felt but in it no sensation of heat. Dates half ripe for cooking.
20	87	88	85	86	91		Tatties. Wind still N. W. but weather getting warmer; cool in the wind but out of it heat is felt. The wind is hot in puffs and generally hot from 7 to 10 P. M. 3 hours calm on 21 from 10 P. M. to 2 A. M. very warm but not oppressive; sandflies during the calm tormenting.
21	88	89	86	87	93		Tatties. No wind this morning but air agreeable at 10 A. M. wind springs up at W. N. W.; hot wind till 10 P. M, then calm.
22	88	90	86	87	94		Tatties. The N. Wester evidently dying off; till pleasant however and thermometer 82 close to the tatty; hot wind till 10 P. M. then cool.
23	88	90	86	87	94		Tatties. Calm but pleasant N. W. veering to W.; weather increasing in heat but still the N. W. wind keeps it cool; night rather warm.
24	88	92	84	88	95		Tatties. Calm weather; growing very hot; N. W. then E. and N. E. at 11 P. M. S. E. the heat very oppressive; came in from veranda and slept under the punka very comfortably; very hot all day; wind at E. S. E. and E. but almost none; very oppressive.
25	88	92	86	86	94		Tatties. Slept to night on the terrace; exceedingly pleasant and gentle airs all night; in the fort the people could not sleep from the excessive heat.
26	88	93	93	93	94		Tatties. Pleasant morning but hot atmosphere, Wind W. then N. W. slight but hot.
27	88	92	84	88	96		Tatties. Strong N. West wind set in after 12 P. M. sky cloudy and sun and moon obscured; hot strong N.W.; obliged to descend from terrace at 2 A. M. on account of high wind.
28	90	92	86	88	96		Tatties. Continued hot all day; close to tatty thermometer 78 degrees; slept in veranda to night; cloudy.
29	88	90	86	86	92		Wind still strong at N. W. but cooler; delightful all night; clouds at 10 P. M. but after that time cool & veering to S.W.
30	88	92	86	86	92		Charming morning; moderate N. Wester still; delightful day and night; the wind not hot now in the evenings.
31	88	90	86	86	92		Delightful again; wind at N. W. strong breeze; occasional hot puffs; delightful evening and night.

August.

Monday, 1st New Moon. ☾ 18. Full 21. 5 h.

DAYS.	4	9	2	5	9	AVERAGE	WINDS &c.
1	88	90	85	...	...		Cool and delightful morning; wind strong at noon always without intermission from N. W.
2	...	...	...	...	...		Was too ill to attend to the Thermometer.
3	...	...	...	...	...		Still wind N. W. and delightful weather.
4	...	...	...	...	...		The Shurgee (S. E. wind) commenced and was excessively distressing; heat the greatest yet felt; I was attacked with a swelled face (a common complaint) and suffered a good deal.
5	...	...	...	...	...		The North-west wind again set in strong and cool and delightfuly fresh all night.
6	...	...	...	...	...		Delightful morning; N.W. strong and cool.
7	88	90	86	85	94		Tatties. Do. do. do.
8	87	91	87	86	93		Tatties. Do. do. do.
9	88	91	88	86	94		Tatties. Do. do. do.
10	88	92	86	86	93		Tatties. Delightful till 5 P.M., when wind died away and changed to East; oppressive heat for two hours; then cool breeze from E., from S E. and S.W. all night.
11	88	90	92	93	93		No tatties. The Shurgee continues to-day, but wind constantly changing; generally S. and S.W. strong N.E. at midnight; then delightful S. W. till the morning when it became calm; Variable all day; light winds and great heat in the day.
12	87	91	94	93	93		No tatties. N. E. again from 9 to 2 then South-west; those who slept on terraces for the last three nights found it delightfully cool; those in sheltered places and houses dreadfully oppressive; light N. winds in the morning and very warm; close warm night; no wind till 9 A. M.
13	88	90	91	91	92		No tatties. Wind very hot from N W.
14	88	100	92	93	94		No tatties. Continued a North-wester all night; pleasant.
15	89	90	88	80	93		Tatties. North-wester but not strong; all night pleasant.
16	89	90	86	86	92		Tatties. N. W. strong; rode round the island this morning and quite cool till 7 A.M the S.E. wind set in at 7 P.M. cool wind and *strong* all night.
17	88	90	94	94	94		No tatties. Variable winds during the past night, chiefly S. W and S. very cool; morning still and close.
18	89	90	90	94	93		No tatties. Morning again still and close but the night delightful; generally S. E. all night; and E. and S. E. till 1 P.M. when N. W. by W.; very oppressive from 6 P.M.; then cool.
19	90	91	94	90	94		Tatties. Morning still and close; at 1 A.M. very warm wind and variable; oppressive till 1 P.M. when a N. Wester set in; evening delightful; West wind till 1 A.M. then close till 3 A.M. then cool till 7 A.M S.W.; then close; wind E. and

Days.	4	9	2	5	9	Average.	Winds &c.
20	88	90	92	88	92		S. E A Shurgee and variable all day until 1 A.M. of 21st, when N.E. then N. W.
21	89	92	93	89	93		Tatties. Hot wind and warm till 5 P.M. then cool west wind ; at 1 A.M. wind set in at N. W. a strong gale.
22	89	94	97	86	94		Tatties. Strong gale at N. W. to W. all day but wind hot ; all night strong N.W. and cool and agreeable all night.
23	90	94	97	87	93		Tatties Do. Do. at N.W. by W. Do. Do. very hot ; all night N. W. wind raises Thermometer to 97 ; *close to Tatty* 84 only ; night very agreeable.
24	90	93	93	92	92		No Tatties. Moderate breeze at N. W. by W delightfully cool wind. No tatties all day ; cool winds and delightful night N. W. wind ; towards morning felt cold.
25	86	89	91	94	93		No tatties. The temperature of the air greatly reduced to-day ; wind still strong at N. W. by W. the dates on the island ¾ eaten up ; great caution recommended not to get cold by sudden changes; colds give fever at this season ; cool all night.
26	88	90	92	86	92		Tatties. Wind comes round to West at 6 A.M. N.W. all night ; morning delightful; also the night ; threatening gale in the evening ; figs ended.
27	88	90	92	86	92		Tatties. strong N. W. gale all night and all day ; clouds of dust ; quite cool all night.
28	85	88	90	90½	90		No tatties. Gale moderated ; gentle cool N. W. wind in morning and all day ; warm night from 1 A.M when it fell quite calm ; air cool though oppressive.
29	83½	88	91	91	91		No tatty. Calm, but air very cool in riding quick ; very warm till 2 P M. when a slight breeze set in ; little wind ; calm at 7 P. M. slept in tent ; delightfully cool W. N W from 12 to 4 A.M. then calm ; gentle N. W. wind at 6 A.M. East at 10 A. M. and warm but the wind cooling ; At 2 N. W. by W. again inclining to west in the evening ; night calm and close till 1 A. M
30	84	88	89	90	89		N. W. wind gentle at 1 A.M. and delightfully cool till daylight : then calm
31	84						

Average temperature of European Hospital at Karrack with wet Tatties.	Sunrise.	12 o'clock.	3 P. M.	8 P. M.	Average.	
July	87	92	91	90	89	Tatties till the 15th September.
August	89	93	94	91	92	
September	85	92	93	88	89½	
October	79	81	87	84	81	
November	72	78	78	75	76	
December	64	65	65	54	64½	

In May and June, the heat was as great as in July, and the nights during two months from 15th July to 15th September, are at times very oppressive and always hot, although a change for the better was perceptible about the 20th of August.

ART. IV.—*Extracts from the Proceedings of the Bombay Branch of the Royal Asiatic Society.*

At a Special General Meeting of the Bombay Branch of the Royal Asiatic Society held in the Library Rooms on Friday the 30th December, 1842, agreebly to the following Resolution of the Monthly Meeting held on the 14th instant :—

" The Rev. Dr. J. Wilson having intimated his intention to send in his resignation as President of the Society, it was resolved :—

" That a Special Meeting of the Society be convened, for the purpose of testifying their sense of Dr. Wilson's valuable services, and high respect for his character."

It was proposed and carried unanimously :—

1. That a Committee be appointed to draw up an address to Dr. Wilson, expressive of the great respect for his character, and of the high estimation in which the services which he has rendered the Society, during the time he has filled the office of President, are held, — and of its great regret at the cause by which it is deprived of a continuance of his able and valuable services.

2. That the Committee for the above purpose consist of Colonel Dickinson, Dr. Kennedy, J. L. Phillips, Esq., C. Morehead, Esq. M. D., and the Secretary.

3. It was further resolved, that to mark the sense of the Society of the valuable services rendered by Dr. Wilson in the cause of Oriental Literature, he be requested to accept the office of Honorary President of the Bombay Branch of the Royal Asiatic Society.

4. With reference to that part of Dr. Wilson's letter, referring to the copies of Yaçna and Vispárád in his possession, that he be solicited to permit them to be lithographed at the Society's expense.

5. That Dr. Wilson's letter, read at the Meeting, be printed.

The following is the letter referred to :—

My Dear Sir,—I have the pleasure of forwarding to you for the Bombay Branch of the Royal Asiatic Society, a copy of a work by myself, which has just issued from the press, entitled "The Pársí Religion, as contained in the Zand-Avastá and propounded and defended by the Zoroastrians of India and Persia, unfolded, refuted, and contrasted with Christianity."—This work I have taken the liberty of inscribing to the Office-bearers and Members of the Society, in token of my gratitude for the kindness and indulgence extended to me while very imperfectly discharging the duties, and supporting the honours, of the Chair, and for the warm interest which many of them individually have taken in my labours to disseminate useful, but more especially divine, knowledge among the Natives of this great country, whose present social and moral condition, as well as past history, it is one of the principal objects of the Society to investigate and unfold. Though the volume is in some degree controversial in its form, it is fully expository of the principles of the Zoroastrian creed as set forth in the recognized standards, the interpretation, and commentaries of its past and present votaries, and the notices and allusions of classical record and oriental tradition. It contains also several tolerably close translations from the Zand and other Iranian languages, which may, in some degree, facilitate their study in the case of those who may not hitherto have directed to them their attention. I could wish that it were more worthy your acceptance, but such as it is, it has cost me a degree of labour and research which nothing but a warm and sincere regard to the highest interests of the interesting and enterprizing class of Natives whom it more immediately respects, could have originated and supported.

I am the more gratified in being able at present to send to our Society this token of my personal regard, because my unavoidable departure for Europe renders it necessary for me,—as I now do,—to tender to the Society my resignation of the honorable office which I have held, through its favour, for upwards of seven years.

In taking leave of the Society, I cannot but express the great gratification and satisfaction which I have enjoyed in its fellowship since the day I was enrolled as one of its Members. The objects which it seeks to accomplish are highly important, whether they be considered as referring to the diffusion of literary and general information, and the cherishing of a liberal sympathy among the members of our own body during their Indian exile, — or the investigation of the languages, customs, religions, an-

tiquities, history, and present state of the interesting land in which we sojourn, and the other countries of the east which are contiguous to it; and the study of the diversified forms of the works of God by which we are surrounded. The foundation by it of the best and most extensive Library in Asia, the establishment of a general Museum, which, though long overlooked, now enjoys, in your own concern for its prosperity, the highest scientific superintendence; and the varied and numerous contributions which its members have made to oriental literature and to science, are unequivocal proofs that it neither has been inactive, nor unsuccessful in the pursuit of these objects. When I was first called to occupy its chair, I took the liberty of briefly reviewing its past proceedings, and glancing at the field of its present inquiry. I could willingly now advert to its intermediate proceedings, and those of its resident and non-resident members which have been conducted independent of its auspices; but I have not leisure, at this hour, to do them the justice even of a distinct mention. Major General Vans Kennedy has with singular ability and acuteness, clearly expounded the peculiarities of the six Indian philosophical schools; and ingeniously compared them with the system of the West. The merits of Mr. Wathen have been next to those of James Prinsep in the discovery of the cave character of India, and the decipherment and translation of ancient inscriptions, the most satisfactory historical authorities of the east. Dr. Bird is most zealously continuing research in the same department, and will soon favour us with a curious and interesting volume. The late Mr. Dickinson furnished us with what we fondly hoped were nearly the first fruits of his high attainments, and historical research and correct and classical taste, in his critical remarks on the Arabic language, and his inquiries into the destiny of the tribes of Israel and the history of Armenia. Dr. Stevenson has opened up a very curious subject of investigation in his interesting and learned papers on the Ante-Brahmanical worship of the Dakhan; and he has unsealed some of the greatest mysteries of Hinduism by an actual translation of the most distinctive portion of the Sáma Veda. Colonel Sykes has laboriously collected and philosophically analyzed numerous notices of the state of Society in India during the period of the supremacy of the Buddhas, as well as interspersed them with theories, which, established or rejected, must awaken inquiry, as well as aid the arrangement and distribution of facts and circumstances which have been already noticed. In the papers of Captain

LeGrand Jacob of Katiawar, we have had proof of that exemplary diligence and ability, which, if generally imitated and evinced, would soon make us familiar with the antiquities and peculiarities of the different provinces with which we are more particularly connected.—Along the line of march of our army to and from Affghanistan, we have been conducted by a most observant guide, Dr. Kennedy, whose pages bear the impression of much more than the lively fancy, and the play of wit and good humour, by which they are distinguished.—I dare scarcely allude to the last work of the late Sir Alexander Burnes, the most enterprizing of our modern British travellers, and in whose death our country suffered its greatest loss, amid late catastrophies. The Hon. M. S. Elphinstone, formerly President of the Society, has given to the world the calmest and most judicious digest of the History of India which has yet appeared, and interspersed it with the result of his own correct observations of the present state of Native Society. We have lately been joined by several promising members; and our Quarterly Journal, so ably conducted by yourself, will, I doubt not, greatly quicken and facilitate their researches. Mr. Eastwick, to whom we have already been indebted for a translation of the Kissah-i-Sanján, and who is the author of the translation of the Zartusht-Namah in the volume which I send to you, will, I hope, give us versions of all the most curious legends of the Zoroastrians to be found in the Persian language. Captain Ramsay and Mr. Glasgow have furnished us with the legends of the Kathís, one of the most conspicuous tribes in the peninsula of Gujarát; and they may very profitably continue their collections and translations. The Royal Asiatic Society of Great Britain and Ireland, in noticing in their annual report my own paper on the Jungle Tribes of the Northern Konkan, have strongly expressed their wish to be put in possession of articles of a similar nature connected with the several districts of India. The illumination, conversion, and social elevation of the natives, I need scarcely observe, are most intimately connected with our discovery and consideration of their actual state.

I am happy to be able to inform you that the lithographing from my own MS. of twenty-five copies of the Vandidad, in the Zand language, but Gujaratí character with a Gujaratí translation, paraphrase, and comment by Aspandiarjí Framjí assisted by Mulla Firuz and other learned Dasturs of the Kadmi sect, as proposed by Dr. Buist and Mr. Pigott, and readily acquiesced in by the Society, is now completed. The work forms two

neat octavo volumes, and will prove an acquisition very acceptable to the Orientalist desirous of studying the sacred books of the Pársís. It contains their *doctrinal* standards, with many of the traditions from the Pahlivi and Sanscrit, which are supposed to illustrate it. It is put forth exactly according to the copy which came into my possession. I instructed the native who corrected the proofs, to tolerate no departure from the original manuscript, even where it might be thought to be somewhat erroneous. It is a mere *help* to a critical rendering and interpretation of the Vandidád, and as such only should it be received. The copies should be judiciously disposed of, if not sold at cost. There has scarcely been time to receive any orders for any of them from Europe. One, however, has come to my hands. It is from the Chief Librarian of the University of Edinburgh, the Rev. Dr. Brunton. I should like soon to know what the Society intends to do in reference to lithographing the Yaçna, and Vispárád, which interspersed with the Vandidád, complete the Larger Zoroastrian Liturgy. Translations into Gujarátí of the Khurdá Avastá, or Minor Liturgy have been published by the Pársís themselves.

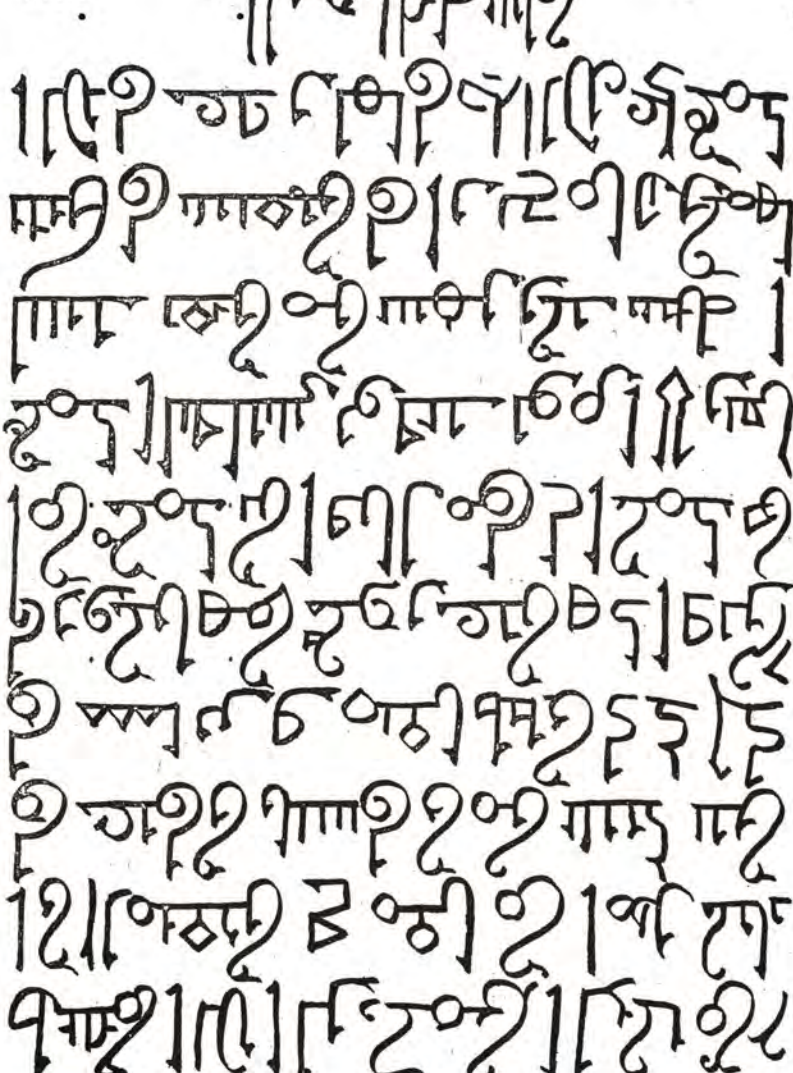
I beg to present to the Society two Cufic inscriptions from the South of Arabia. I have kept them by me for some time, in the fruitless hope of being able to forward with them translations. If fac-similes of all the unpublished inscriptions in the museum, were from time to time given in the journal, no difficulty I think would occur in procuring versions. I also present to the Society a copy of the Zartusht-Námah in Persian, lately lithographed on my own account; and a copy in three volumes, folio, of the best edition of tha Greek Lexicon of Suidas.

It is not without emotion I sever this link which has bound me to office with the Society; and I beg to assure the members that I shall ever remember with gratitude the kindness which I have experienced at their hands. As opportunities are presented, I shall continue to prosecute the objects which they have in view, and seek an early opportunity of disposing of, in some form or other, the fragmentary collections which I have made in connexion with late investigations. If I can be of the slightest use to the Society in Europe, or in my contemplated journey in Egypt, Arabia, Syria, and other parts, I beg them to command my services.

I am, my dear Sir, yours very respectfully,

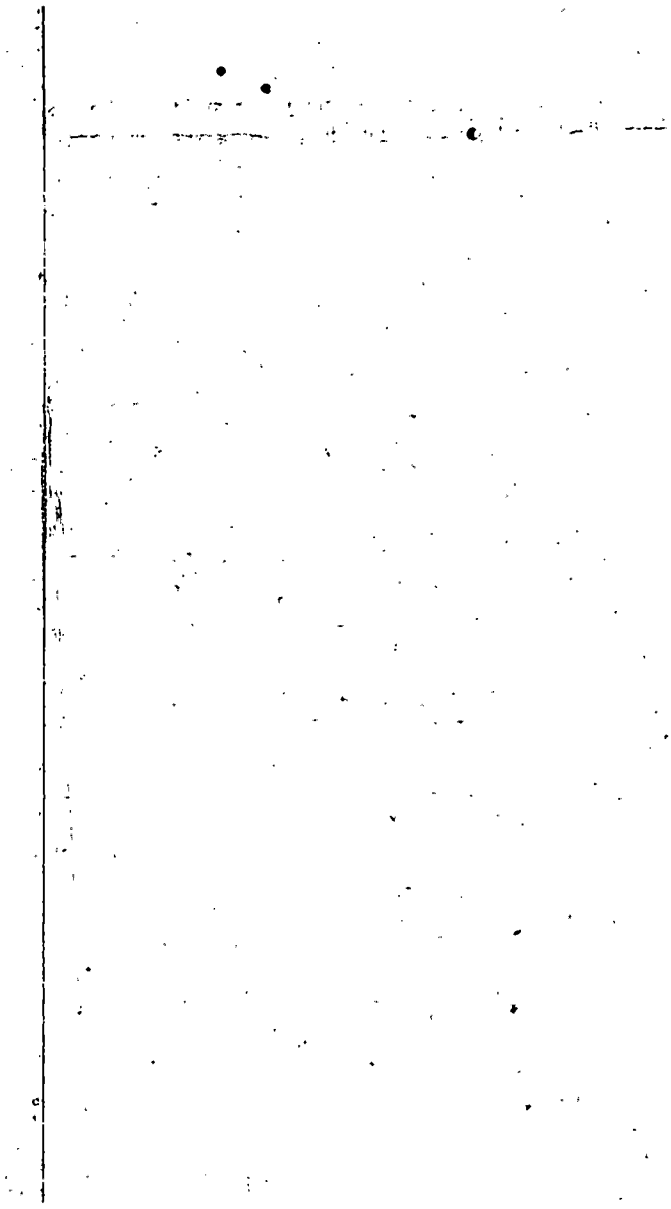
JOHN WILSON.

No 2



Fac-simile of a Cufic Inscription taken from one of the Stones from South Arabia, presented to the Bombay Branch of R. A. Society by Dr Wilson, Honorary President, in December 1842

Two semiles of a Cufic Inscription taken from one of the Stones from South Arabia, presented to the Bombay Branch of R. A. Society, by Dr Wilson, Honorary President, in December 1842.



P. S.—I have put into Mr. Westergaard's hands the Hamyaric inscription from Aden. He has completed the decipherment. It has turned out to be exactly what it was represented to be at our last meeting.

J. W.

To J. G. MALCOLMSON, ESQ., M. D., F. R. S.
Secretary Bombay Branch of the Royal Asiatic Society.

ART. V.—*Fac-similes of two Arabic Inscriptions, in the Cufic character, from Tombstones in Southern Arabia; presented by Dr.* WILSON, *Honorary President of the Society, with remarks, translations in English, and transcripts in Arabic, by* JAMES BIRD, Esq.

The Fac-similes of these Inscriptions were lately presented to the Society, by the Rev. Dr. Wilson, without any information being given as to their localities, beyond a statement that they were taken from tombstones in Southern Arabia. The contents of them are not without interest; as the earliest of them, No. I, dated Hejra 326, A. D. 938, makes mention of the tribe of *Muzaynat*, inhabiting this part of the country; and No. 2, dated Hejra 472, A. D. 1080, states that the person buried was the emancipated slave of Mahomed-al-Teflisee, shewing that the intercourse which existed between Southern Arabia and Persia, from the middle of the sixth century of our era, was still kept up in the end of the eleventh. Aden appears to have been the emporium of this part of the country from the earliest times, being mentioned, by Ptolemy the Geographer, as a city of Arabia Felix, situated on the ocean, in the kingdom of the Homeritæ, or family of Hamyar, descended from Kahtan, son of the patriarch Eber; whose descendants are distinguished from the foreign or adopted Arabs of the family of Ismail, among which the tribe of *Muzaynat* was one, and to which the lady mentioned in inscription No. 1, belonged. About the year A. D. 570, the Abyssinians, who invaded Southern Arabia at the instigation of the Emperor Justinian, anxious to wrest from the Persians their monopoly in the silk trade, had subjugated Yemen, and subverted the Jewish religion in this quarter, substituting in its place that of Christianity. Abrahah, surnamed Al'Ashrem, who was the Abyssi-

nian General, seeing the advantages derivable from the concourse of pilgrims frequenting Mekkah as the shrine of the Sabean idolatry, determined to erect a rival fabric at *Sanaa*, to which pilgrims from all parts of the world might resort. To this building, which appears to have been dedicated to the Christian faith, not without some admixture however of the Sabean idolatry, Abrahah gave the name of the Keleisa, or Church; which was completed in exquisite workmanship, and splendour of decoration, calculated to ensure the veneration of all pilgrims frequenting it. In the same metropolis too, was the palace or mansion of the Hamyar kings of Southern Arabia, called *Ghumdan;* which Masudi, writing in the beginning of the tenth century, A. D., states to have been one of the two most famous palaces on earth, and of which the other was the Aiwani Kisra, on the Euphrates near Ctesiphon, and of which an arch is yet remaining. The former is only of interest in the history of Southern Arabia as having been the probable site of those numerous inscriptions, on white marble and stone, discovered in the walls of the houses at Sanaa, by Mr. Cruttenden of the Indian Navy, and said by the inhabitants to have been brought from *Mareb*, or the ancient Saba. This character, of which inscriptions have been found at *Hassan Ghoràb* near Aden, and at *Hammam* and *Dis*, has been conjectured to be the *Hamyàric*, while others have supposed that it bears a strong resemblance to the Ethiopic. Certain it is, however, that the use of it, in Southern Arabia, preceded the Arabic character called *Anbary*, and may be the same as the *Mosnad*, or the more ancient character called *Ismaeli*, or *Suri*, which was used previous to the introduction of the Cufic, in which the two inscriptions now translated are written. Captain Haines lately transmitted to the Society a copy of an inscription, in the same ancient character, as found at Sanaa and Hassan Ghorâb; and which he states to have been taken from a block of white marble dug up in the neighbourhood of Aden. The latter was the port of this part of the country, and the residence of a Nestorian Bishop under the metropolis of Dhafa-, whose metropolitans were ordained from Persia, in the time of Cosmas Indicoplestes, about the end of the sixth century: from which period the intercourse with Persia seems to have been constant and uninterrupted. The surname of *Al-Teflisee*, used in inscription No. 2, shewing that the person mentioned was an inhabitant of Teflis in Georgia, would indicate the residence in Southern Arabia of Persian families, even as late as the end of the eleventh century; and to

whom the Zeidi sect of Shias, or followers of Ali, now residing at Sanaa probably owe their origin. The whole of this part of the country offers a wide and interesting field of research for the philologist, and antiquarian; and as the same traditions regarding the fall of Adam and his expulsion from Paradise, with his subsequent residence on the mountains of Ceylon, * are known in the history of the Arabs as well as in that of the Bauddhas, it may be of some utility in tracing the religious history of the latter, to ascertain the nature of that connexion which subsisted between Arabia and India from the beginning of the Christian era.

Translation into English of Inscription No. I.

God hath borne witness, that verily there is no God but he, and the angels, and those endowed with wisdom, who professing the same execute righteousness. There is no one but God, the mighty, and the wise.

In the name of God, the compassionate, the merciful. Be merciful, O God! to your slave, the daughter of your two slaves, Fatimah daughter of Ismail, the son of Ibrahim-al-Muzanee: for as much as she was professing there is no God but you, and Mahomed is your slave and prophet. May the peace and blessing of God be upon her, who was declaring your unity, acknowledging your supremacy, was continually trusting to your mercy, and in need of your pardon. Now indeed and departure from friends have conveyed her to you and through which separation from her family, the abodes of the living are become sad, and those of the dead joyous by her association with them; when having retired from this world of trouble, and far from the habitations of men, she has abandoned both family and property. Be merciful to her, O God;

* The figure of *Buddha's* foot which exists at the top of *Adam's peak* in the Island of Ceylon, was identified as a type of our great ancestor previous to the arrival of the Portuguese, on the shores of India; and the Mahomedan author Masudi, A. D. 943. makes mention of mount *Rahwan*, on which Adam descended when expelled from Paradise, adding that a race of Hindus, in the Island of Ceylon, descended from Adam, derived their origin from the children of Cain. The analogy between these traditions of the *Arabs* and *Buddhists*, may probably be traced back to that period of early history, when both people were *Samaneans*; and maintained, according to the authority of the *Mefatih-el-'olum*, that the world had no beginning; while they believed in the metempsychosis, and that the earth is constantly declining.

pardon her faults and forgive her offences; make spacious her grave, be her companion in her solitude, and join her to her prophet Mahomed, on whom be peace. She died, and may God be merciful to her, on Sunday the sixth day of the month of Ramzan, in the year 326.

Transcript of Inscription No. I in modern Arabic characters.

بسم الله الرحمن الرحيم

اللهم ارحم امتك وبنت عبد يك فاطمة ابنت اسمعيل بن ابراهيم المزني فانها كانت تشهد ان لا اله الا انت وان محمد عبدك ورسولك صلي الله عليه وسلم مقرت بوحدانيتك معترفت بربوبيتك لم تزل فقيرت الي ارحمتك محتاجت الي امغفرتك وقد اسلمها اليك الا و خلاص الا ولياء فانفردت من الاخلاء واوحشت بفقدها منازل الا حياء وانست بجوارها الموتا وباتت عن المزار وبعدت عن الديار وحالت عن الاهل والمال اللهم اغفر خطيتها وتجاوز عن سيتها واوسع لها في حفرتها وكن لها في وحدتها وانحقها بنبيها محمد عليه السلام توفيت رحمها الله يوم الاحد لتسع خلون من شهر رمضان سنت ست وعشرين وثلثمايت شهد الله انه لا اله الا هو والملا يكت واولوا العلم قايما بالقسط لا اله الا هو العزيز الحكيم

Translation into English of Inscription No. II.

In the name of God, the compassionate, the merciful.

"But the pious shall be lodged in a place of security, among gardens and fountains: they shall be clothed in brocade and satin, and shall sit facing one another. Thus shall it be: and we will espouse them to fair damsels, having large black eyes." *

This is the Tomb of the mother of Mahomed-bin-Ikbal, the emancipated slave of Ahmed-bin-Mahomed Al Teflisee; who died on Wednesday, when six days were wanting to complete the month of Rajab, in the year 472. May God be merciful to her and pardon her crimes; and may God's peace be on the prophet Mahomed and his descendants.

* See Sale's Al-Koran, end of Chap. 44.

Transcript of Inscription No. II in modern Arabic Characters.

بسم الله الرحمن الرحيم

ان المتقين في مقام امين في جنات وعيون يلبسون من سندس و
استبرق متقابلين كذلك وزوجنا هم بحور عين هذا قبرام محمد بن
اقبال مولي احمد بن محمد التفليسي توفيت يوم الاربعا ست بقين
من شهر رجب سنت اثنتين وسبعين واربع مايت رحمها الله وغفرلها
وصلي الله علي محمد النبي واله وسلم

ART. VI.—*Extract from the Proceedings of a Meeting of the Bombay Branch of the Royal Asiatic Society on the 14th December*, 1842.

Read the following letter from the Curators of the Museum of Economic Geology of India, requesting the assistance of the Society and its members to carry out the views of the Committee of papers of the Asiatic Society and of Government.

The Curators were authorised to forward to Calcutta, any duplicates that might be considered useful.

"SIR,—I am authorised by the Committee of Papers of the Asiatic Society, to forward to you the accompanying Memorandum relative to the MUSEUM OF ECONOMIC GEOLOGY OF INDIA now forming, in the confident hope that you will personally, and through your friends, kindly assist their views and those of Government, as far as lies in your power.

With respect to carriage of Specimens, such small ones as may not exceed the usual dawk banghy weight, say 500 tolas, may be sent at once, addressed to the Secretary of the Asiatic Society, and those above that weight despatched by the nearest water carriage, preferring the Steamers, if obtainable.

I am, Sir,

Your obedient Servant,

H. PIDDINGTON.

Curator, Mus. Econ. Geology of India."

CALCUTTA, November, 1842.

MUSEUM OF ECONOMIC GEOLOGY OF INDIA.

The objects of the Museum of Economic Geology of India, which has been established by Government at Calcutta, under orders from the Honorable the Court of Directors, in conjunction with the Asiatic Society and at its Rooms, are the following: They are, as scientific men will perceive, generally those of Economic Geologists in all countries, but there are some peculiarities connected with India, and the situations of Europeans in it, which will oblige us to go into a little detail, to explain to those who may not already take an interest in these matters, our wants, our wishes, and our hopes of the advantages which may accrue to the community from this new establishment. Its objects then are briefly these:—

1. To obtain the most complete Geological, Mineralogical, and Statistical knowledge possible of all the mineral resources of India, wrought or unwrought, so as to make them as publicly known as possible; to shew how they have been, or are now wrought, or how they might be so to the best advantage.

2. To obtain a complete set of specimens, models, and drawings, relative to the Mining operations, Metallurgical processes, and Mineral manufactures of all kinds, of India, Europe and America; so as to afford to the public information of every thing which can be turned to account here or in Europe, and perhaps prevent loss of time, waste of capital, and disappointment to the Indian speculator.

3. To furnish the Engineer and Architect with a complete collection of all the materials, natural or artificial, which are now, or have formerly been used for buildings, cements, roads, &c. and of all which *may* possibly be useful in this department, whether European or Indian.

4. To collect for the Agriculturalist, specimens of all kinds of soils remarkable for their good or bad qualities, with the subsoil, subjacent rocks, &c. and by examination of these, to indicate their various peculiarities and the remedies for their defects.

5. To collect for Medical men, the waters of mineral springs, mineral drugs, &c. &c.

6. And finally, by chemical examinations of all these various specimens, to determine their value, and how they may be best turned to account for the general benefit of the community.

With objects like these the Museum of Economic Geology may be said to be placed between the purely scientific geologist and the merchant, the

miner, the farmer, the manufacturer, and the builder, or in other words, the merely practical men, who may desire to know how the knowledge of the geologist and mineralogist,—to them often so recondite, and apparently so useless, — can forward their views: and its office, to be, if possible, to answer all questions of this nature which may arise, for public benefit.

This may sometimes be done from books, but the great library must be the collections of our Museum, which are in fact a library of examples, to which the commentary is the laboratory; where, aided by the resources of the collection, questions may often be solved in an hour, a day, or a week, which it would take half an *Indian* life to obtain the mere materials for investigating. An extensive collection, then, is the first requisite, and this should, if possible, comprise every inorganic product of the earth from which mankind derive any advantage, with every information relative to it. It will readily occur to the reader, that in India, owing to her infancy in some of the arts dependent on these products, as in mining, agriculture, &c.; and her singular progress in others, as in peculiar branches of Metallurgy and the like, our almost absolute ignorance of what her methods and resources are, the peculiarities of situation in which these resources may exist, those of climate, workmen, and many others, we have almost every thing yet to learn; and that to accomplish our objects, we cannot be too well furnished with all the knowledge and examples of Europe and the Americas, and all those of India, or of Asia. Without these, our progress must be very limited; but in proportion as we obtain them, we may hope, without presumption, to see the day when the mines, the quarries, and the soil of India may be done justice to, which assuredly, has never yet been the case.* In this all classes are so clearly interested, that it

* It is curious to find that upwards of 140 years ago, the ores of the precious metals were an article of export from the Dutch East Indies! This is clearly shewn by the following passage from Schlutter's work, as translated by Hellot, and published by him under the title of "Hellot sur les Mines," Paris, 1753. In Vol. II. p. 235, Chap. XLVI. "*On East Indian Ores and their Fusion by the curved Furnace,*" he says—

"In 174, Schlutter received by a private channel twenty-five quintals of ore from the East Indies, &c." And again: "These sorts of ores (of gold and silver) sent from India by the Dutch were frequently smelted at the foundery of Altenau in the Upper Hartz, but had never been smelted in the Lower Hartz. This ore was in lumps from the size of a nut to that of walnut, and by trials it was found that the quintal of 110lbs. contained 1 oz. 8 drs. of gold and 3½ oz. of silver."

would be superfluous to shew it, as it is to shew that the resources of every country are far more readily developed with public means for investigating, preserving, and publishing all knowledge belonging to them, than where none such exist.

It is therefore hoped, that those who may be desirous of assisting this great public work, will bear in mind, that nothing, however familiar it may be to those on the spot, is indifferent to us; for *if not wanted for the institution, it may serve to procure that which is;* and the following note is given rather as a general memorandum than as specifying all which is desired. The general rule is, that details cannot be too numerous, nor specimens too various, particularly if purely Indian.

DESIDERATA FOR THE MUSEUM OF ECONOMIC GEOLOGY OF INDIA.

1.

Mines and Mining Products.

1. Specimens of all crude ores, just as found. If possible also, of the rocks or matrix in which found; of those indicating the vein at the surface; of the walls of the veins; of the strata or beds passed through before reaching them; and of the rocks of the surrounding country.

2. The ores after preparation for the furnace by picking, washing, stamping, roasting, &c.

3. The rejected ores, gravel or stones found with those used; which often go under old names, as those of "mother, devil," or the like.

4. The fluxes used, if any.

5. Memorandum of the kind of fuel used, samples of it if coal or coke, &c.; names of the trees, as bamboo, &c. if charcoal; and if not too far, send specimens.

6. The roasted or half smelted ore.

7. The pure metals, as obtained in a merchantable state, of all the qualities.

8. The slags, of all kinds, from the furnaces and smeltings.

9. Drawings or models (to scale of possible) of all furnaces, machinery, and implements used in any of the processes, with drawings, plans, and models of the mine. Earthen models of the furnaces, &c. may often be well made, by the native image makers for a mere trifle.

10. Specimens of any tools used.

11. Traditions, history, and statistics of the mine or mineral products, as (1.) How and when found; (2.) Produce, gross and net; (3.) Rent if farmed, or what tax payable on the product; (4.) Price of daily labour; (5.) Amount of labour obtainable for a given price; (6.) Estimated profits, past and present; (7.) Reasons for decay or increase; (8.) What is now required to make the mine more productive; (9.) Copies or notices of any books or accounts of the mine; (10.) Health, comfort, morals, and condition of the workmen employed, average of ages, and of life among them if thought unhealthy; seasons and hours of work. Superstitious notions, peculiar diseases, &c. &c.

II.

Buildings, Cements, Pottery, Colours, Roads, &c.

1. Specimens from the quarries, of all kinds of building stones, useful or merely ornamental.

2. The same of limestones, shells, corals or other articles, used to make lime or cements of all kinds.

3. Specimens of the strata above and below the quarried stone.

4. Any fossil shells, bones, fish, plants, insects, or other appearances of organic remains large or small, found in or near the quarries, or amongst the rubbish and watercourses of quarried spots. If specimens appear too large to move, please to give a notice, with an eye-sketch, and estimate of the expense of moving, and preserve it till a reply is sent.

5. Specimens of the building stones or remarkable bricks used in any public edifices, monuments or tombs, with the date of their erection if known, and a note to say if exposed to weather or protected by stucco, paint, or roofs.

6. Memoranda and specimens of any plants or animals destructive to masonry, as boring worms and shells in water, and the like, with specimens of their work.

7. Ornamental or stucco-work: specimens of it, new or old, interior or exterior, with the best account procurable of the materials, preparations, and working of them.

8. Specimens of stones and marbles, shells, &c. used for image or ornament-making; of earths for pottery, and varnishes of coloured earths of all sorts, whether used as pigments or not.

9. Specimens of peculiarly good materials used for roads, whether

ancient or modern, with prices, methods of using them, and other Memoranda.

10. Prices of all the above; rates of labour, carriage, &c. from the rough to the wrought state, and all other statistical details as in the case of Mines and Mineral products above mentioned.

III.

Agricultural Geology.

1. Specimens of soils of good, and the best qualities, for all kinds of produce, as sugar, cotton, tobacco, &c.

2. Of infertile soils or veins of earth.

3. Of the subsoil or rock.

4. Of the stones scattered about these soils.

5. Memoranda relative to the height of these soils above the water of wells in the rains and dry season, and of its drainage, shelter, exposition, &c.

6. Of any kind of earths, mud, or stones used as manures, as peats from the jheels, kunkurs, &c.

7. Of the deposits (fertile and infertile) left either by the common inundations or by violent floods, with memoranda of their effects on the cultivated soil.

8. Specimens from any separate spots, where gravel or stones are collected in quantities after inundations or floods.

9. Accounts of remarkable floods, and average heights of the rise of rivers, of the raising of the soil, alterations in its produce consequent thereupon, and all other details.

10. Memoranda relative to the formation or destruction of river-banks, islands, &c. with measurement if obtainable.

11. Samples of all kinds of efflorescent salt-earths, with specimens of the different salts prepared from them, prices of preparation, selling rates, and accounts of the processes and uses of the salts.

12. Specimens of brine springs, with details of manufactures if boiled for salt, and statistics of labour and produce, &c. as in the case of mines.

IV.

Medical Geology.

1. Specimens of mineral medicines of all sorts, whether produced on

the spot or imported, crude and prepared, with notes and samples of the process of preparation in all its stages.

2. Of the water of mineral springs, their temperature, incrustations about them, account of their uses, and specimens of the rocks or soil in which found.

V.

Native Metallurgical Processes of Mineral Manufactures.

1. Exact descriptions of them, however rude or simple they may appear, with samples of the ores, fuel, fluxes, products, slags, &c.

2. Models or drawings (to scale if possible) of the furnaces and implements of all kinds; specimens of these last may be sent.

3. Memoranda and samples of the earths or sands used for moulds in castings, of the crucibles and beds, raw and baked, and of the raw material from which made.

4. Prices of raw and wrought materials.

5. Drawings of machinery used for turning, boring, polishing, &c.

In conclusion: It is not supposed that any individual, unless wholly devoted to the research, can supply the whole of the desired specimens, or even of the knowledge relative to any one product; but any *single* item of the foregoing may be of importance, at sometime, to some one; and it will be the special duty of the Asiatic Society, and of the Curator of the Museum, to see justice done to every contribution; whether relating to the Geology of India in general, or to this peculiar branch of it.

H. PIDDINGTON,
Curator, Museum Economic Geology.

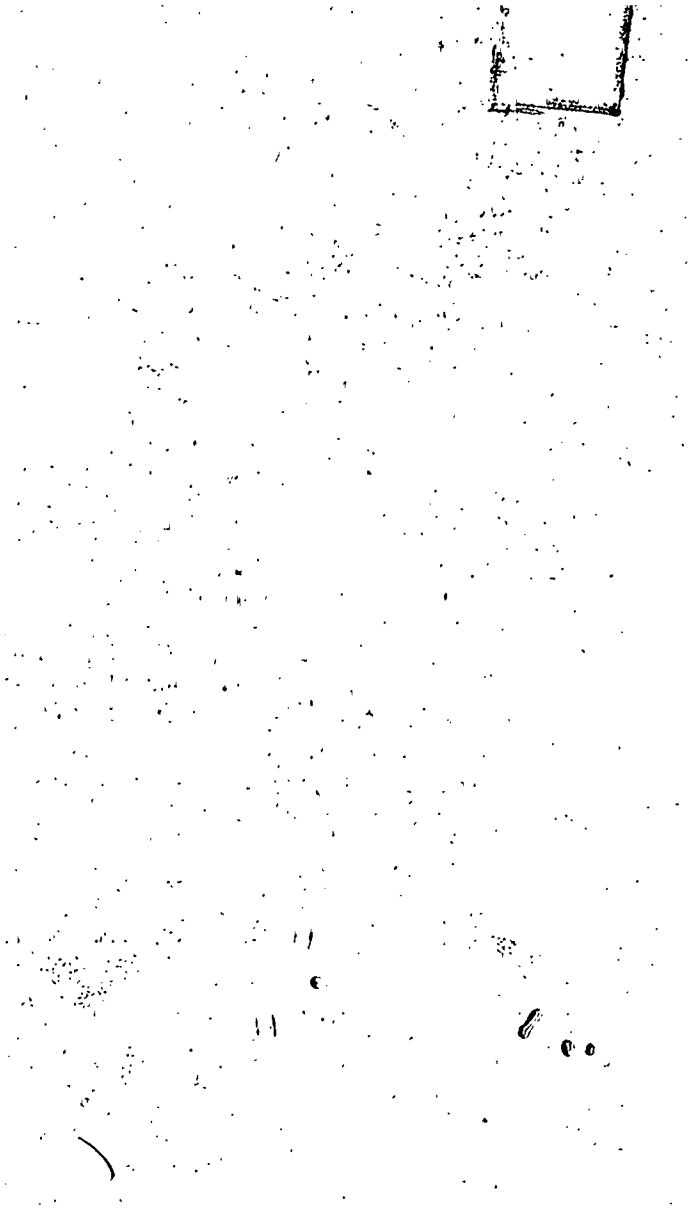
ART. VII. — *Note on Fossil Plants discovered in the Sandstone rocks at Kamptee near Nagpoor.* By JOHN G. MALCOLMSON, Esq.

The accompanying three lithographs represent fossil leaves, discovered in the sandstone quarries on the banks of the Khanan river, opposite to the cantonment of Kamptee, by Lieut. Munro, of H. M. 39th Regt. F. L. S., who at the request of Colonel Walpole, kindly presented them to me. It is very remarkable, that no fossils had been found in these

rocks previous to Mr. Munro's fortunate discovery, as the quarries have been worked for many years, and have been examined by several geologists, including Dr. Voysey, and Capt. Jenkins the distinguished commissioner in Assam. I presume that they must be confined to some thin strata in the sandstone, as during a residence of some years at Kamptee, I did not observe them, although my attention was naturally directed to the subject, by the numerous fossils I had met with in the neighbouring districts. Be the cause of their having been so long overlooked what it may, it affords encouragement to the re-examination of the same rocks which extend over so large a part of the south of India, especially in the Southern Mahratta Country, and in Guzerat, Eedur, &c.

In the Geological map of a great part of the Hyderabad and Nagpoor countries, published in the 5th vol. of the Transactions of the Geological Society of London, I have coloured the Kamptee sandstone, as well as the other rocks of the same character extending along the Wurdah * and Godavery rivers, as the equivalent of the diamond sandstones of the Madras ceded districts, and of the sandstone rocks near Kulladgee, Badamee, and Atchera, in our own neighbourhood. The truth of these identifications, the reasons for which are detailed at length in the paper above referred to, has been since confirmed by a report of Major Wilkinson, the resident at Nagpoor, addressed to the Secretary to the Coal Committee, Calcutta, on the 22d April, 1841. "In Wyragurh, about 90 miles to the south west of the city of Nagpoor, there are diamond mines. I formerly visited them with Mr. Jenkins, when he was resident at Nagpoor; the following

* In the Madras Journal of Science for October, 1834. I have given a figure of a fossil plant, I had discovered some years before in the sandstone of Won in the Hyderabad territory, acquired from the Nagpoor Rajah in 1818. The hill of Won is composed of sandstone, dipping in all directions from the apex, and varying in colour from white to red and yellow. It contains also ferruginous grains or scales, either in seams or disseminated through its substance. In a fragment of this kind much resembling the Bangnapilly diamond Breccia, a fossil was discovered having a compact structure and deep black colour, and it is probably a portion of a hollow, compressed vegetable, the centre of which is filled with the sandstone. It is the only instance that has come to my knowledge of a fossil having been found in the sandstones of Southern India; and as the rock corresponds in Geological position and mineralogical characters with the diamond sandstone, the fact is of considerable interest, even if the formations were not found to be continuous, as will be stated hereafter. The specimen is deposited in the Museum of the Asiatic Society of Bengal. Geological Transactions, vol. 5. p. 557.



is what he has written about them. "The diamond mines of Wyragurh, were formerly celebrated, though now they do not yield sufficient returns to render them worth working. The diamonds were found in earth which forms small hills in the vicinity of Wyragurh. The spots are still distinguishable where they have been dug up. During the reign of the late Raja Raghojee Bhonsla, the mines were worked at a considerable expense, but only a very few small diamonds of little value were found, and they are now entirely neglected."*

But a question of much greater importance here presents itself as to the identity of these rocks with the coal strata of the Bengal Provinces and of the Upper Nerbudda, and also with those sandstone rocks of Guzerat, which appear to be identical in mineralogical characters, and in their geological relations. If this should prove to be correct, coal will most probably be found in the sandstone ranges of the eastern part of Guzerat, in situations sufficiently accessible to render it matter of less regret, that the Nerbudda cannot be rendered navigable much above Tulluckwarra. The fossil plants discovered by Mr. Munro, are, however, too imperfect to enable us to refer them with certainty to any of the few Indian coal plants yet described or figured. They bear a considerable resemblance to the Glossopteris danœoides of the Burdwan coal field, figured by Dr. Royle, in his 2d plate. The narrower leaves may belong to another species, or more probably to a different part of the same plant. The lithographs were executed under the direction of Capt. Smith, of the Madras Engineers, from very beautiful drawings by Mr. Forbes, but as Capt. Smith observes, "subjects like these are very difficult for pen-work lithography, and the people at Madras do not much practice chalk." The consequence is that the cross hatching obscures the structure of the fossil, especially in Nos. 2 and 3. With these plants impressions were found not unlike those of the large bony scales of the sanroid fish of the carboniferous and old red sandstone rocks, especially those of the latter. They are, however, too imperfect to justify any opinion as to their nature, although, in a subject so new, no indication should be overlooked.

* Reports and abstracts of the Proceedings of the Committee for the investigation of the coal and mineral resources of India and Calcutta. Journal of Natural History for July, 1842, p. 290.

Note.—In a paper on the Geology of the country between Byapoor and Bellary, by Capt. Newbold, published in No. 46 of the Journal of the Asiatic

ART. VIII.—*Observations on the Comet of* 1843; *made at the Astronomical Observatory, Bombay.* By DR. BUIST.

Read 12th April 1843.

On the evening of the 4th March, a little after sunset a most extraordinary appearance presented itself in the sky, consisting of a vast beam of light inclining at an angle of 45° towards the South; it was distant about 35° from the moon, which was to the northward. The right ascension was very near one hour; the end of the tail, which when first observed was about 20°, was nearly of the same declination with the moon; the comet itself had set, before its tail attracted notice. The tail was single for about half its length, appearing to exhibit a purplish black shadow at both edges, such as is sometimes perceptible in the bright beams of Aurora Borealis, for which it might, unless from its fixedness and position have been readily mistaken. Towards its upper ex-

Society of Bengal N. S. the following passage occurs, "The softer and finer varieties of the cream colored limestone found in the vicinity of Tallicotta are well adapted for lithographic purposes. Some of the specimens which I brought hence, were sent down to the lithographic establishment at St. Thomas' Mount and found to answer. There is also a fine laminar limestone found in the bed of the river, with beautiful dendritic appearances between the plates. A specimen of this dendritic limestone was examined for me, by Dr. Wight, who kindly affords me the following note. "The arborescent appearance in the slate I think an organic remain. At least, I find, when under a high magnifying power, that the black lines can, with the point of a needle be pricked off without touching the stone, as if the carbonaceous matter of the plant was still there. I feel uncertain, however, whether to call the original a moss or fucus, but think the latter."

As this observation will probably find its way into other works, with the weight which will justly attach to the names of the observers, I think it may be useful to remark, that these markings are probably nothing more than metallic arborizations, such as abound in this limestone wherever it occurs. Fine examples may be seen in the collection of rocks from the Southern Mahratta Country, presented by Lieut. Hibbert of the Engineers especially those from Tallicotta. At page 554 of the 5th vol. of the Geological Transactions, I have noticed a report of the same kind of fossil plants said to have been found in the Cuddapa limestones, but which I ascertained to be mere dendritic markings on the surface of the strata.

tremity it seemed for a few nights to be divided by a thin line of shadow; this was not perceptible after the 10th.

It had been observed so early as the 2nd and 3rd of the month at Madras and various other parts of India, but was not noted at Bombay. At Agra it was for a time believed to be an exhibition of Zodiacal light. The stars were perfectly visible through all parts of the tail.

Bombay 4th March 1843. Altitude of the Summit of the Tail 10° pointing S. E.
" Azimuth of Do. do. 113° } at 7h. 15′ P.M.
" " " Base 104° }

5th March, Sunday. The head was very distinctly visible above the horizon shortly after sunset, and left no doubt that it was a magnificently developed comet. Its splendor was however considerably impaired by the light of the moon; on the 5th and 6th the tail of the comet seemed to vibrate pulses of light appearing to shoot out longitudinally every 15 seconds. This appearance was observed by several individuals simultaneously, who were perfectly at one as to the interval of time between the pulses. There were no more noticed after the 7th, on which night they were only slightly apparent. The subjoined observations were made at the Bombay Government Observatory, Colaba, Lat 18° 53′ 52″ N. Lon. 4h 51′ 19″ E. by Kera Laxuman C. a young Bramin, one of the assistants, who had been carefully instructed by Professor Orlebar. The instrument employed was an altitude and azimuth circle, the length of the telescope being 23 inches, with semi-diameter of the altitude and azimuth circles 6.5 and 8.5 inches respectively, made by W. T. Gilbert. This was placed on a large stone pillar based upon the ground, and terminating under the cupola of the Observatory, at an elevation of 75 feet above the mean level of the sea; the instrument like most of the others in the Astronomical Department of the Observatory, is by no means such as could be trusted for accurate or precise observations. The altitudes given in the subjoined are uncorrected for refraction, and the azimuths are measured from the South and not from the North, as the term generally means. The time given is Bombay mean time at the Observatory.

The following observations were made at the Observatory on the evenings of 6th, 7th, &c. till the end of the month, at which latter date the comet became too obscure to be fit for observation.

Time 1843.				Altitude.			Azimuth.			Approximate length of Tail.	Remarks.
	H.	′	″	°	′	″	°	′	″		
Mar. 6th	6	51	15	7	1	2	74	39	11		Clear.
"	6	56	32	5	46	34	75	6	41		"
"	7	1	44	4	41	20	75	33	31		"
Mar. 7th	6	46	13	10	27	10	73	16	34	34°	"
"	7	1	27	7	2	40	74	39	18		"
"	7	22	52	2	16	57	76	28	17		"
Mar. 10th	6	50	18	15	50	51	71	13	6	34°	"
"	7	11	32	11	5	27	73	17	46		"
"	7	32	36	6	23	51	75	12	23		"
Mar. 11th	6	51	4	17	32	15	70	37	16		"
"	7	21	14	10	48	45	73	38	19		"
"	7	51	31	4	2	20	76	17	38		"
Mar. 13th	7	21	22	14	8	45	72	42	21		"
"	7	35	37	10	55	54	74	4	21		"
"	7	45	36	8	42	30	75	0	44		"
Mar. 17th	7	49	13	13	14	15	74	20	53	34°	Fainter.
"	7	52	5	12	34	45	74	35	7		"
"	7	56	24	11	35	46	75	1	35		"
Mar. 18th	7	45	21	15	7	55	73	46	4		"
"	7	56	27	12	37	1	74	55	17		"
Mar. 19th	8	3	29	11	58	20	75	28	18		Faint.
"	7	3	2	25	32	33	69	5	11		"
Mar. 21st	7	21	34	23	17	49	72	4	16	32°	"
"	7	30	53	21	3	26	72	6	32		"
Mar. 22nd	7	41	19	19	23	22	73	12	4		Very faint.
Mar. 24th	7	39	11	21	3	48	73	5	27	30°	"
Mar. 26th	7	55	52	18	11	13	74	56	35	27°	"
Mar. 27th	7	30	28	24	20	33	72	22	16	26°	"
"	7	38	13	22	37	11	73	12	59		"
Mar. 29th	7	46	58	21	12	25	74	28	9	23°	} Observation within 3 minutes of arc.
Mar. 30th	7	43	56	22	8	20	73	17	55	21°	
Mar. 31st		do.			do.			do.		20	The Head of the Comet disappearing altogether.

The Tail was observed till the 4th of April, on which it disappeared also.

These observations were taken with great care, but the comet becoming obscure towards the end of the month, could not be distinctly seen in the telescope; the observations about that period therefore, should be considered right only within three minutes of arc.

ART. IX. — *Meteorological Observations.*

The Observations in the present number were made at the Magnetic Observatory. The Barometer is a standard of Newman; the readings are

continued as noted from the scale, without correcting for temperature or capillary. The Barometer from which the Observations for May, June, and July 1841, were noted, is a standard by Adie of Edinburgh;— its readings are 0.150 higher than those of Newman; so that assuming this last for the true standard, and as such it is now employed, 0.150 must be subtracted from the observations of No. 1 of the Journal to reconcile them with the others. The most of the instruments in use till September 1842, were the same as those noted by Professor ORLEBAR.

The term-day observations of July due to the following number were lost; the assistants had at this time dropped away one after another, till one only remained and he was sick. From the 1st September the hourly readings continue uninterrupted, and the means of the month, instead of the term-day observations, will be supplied for future numbers after the month of August.

GEORGE BUIST.
In charge of the Observatory.

Magnetic Observatory, Colaba, Meteorological Observations, 21st April 1842.

Bombay Mean Time.	Standard.		Thermo.		Difference.	Correct. Barom.	Wind.	Remarks.
	Barom.	Thermo.	Dry	Wet.			Direction.	
h.								
2 12	29.832	83.5	81.8	76.8	5.0	29.695	N.W.	Clear.
3 "	29.820	83.2	81.8	76.8	5.0	29.674	"	
4 "	29.838	83.0	81.5	77.0	4.5	29.693	N.W.by N.	"
5 "	29.832	82.9	80.2	75.8	4.4	29.687	"	"
6 "	29.850	81.9	80.0	76.0	4.0	29.707		" and calm.
7 "	29.876	82.9	83.2	77.5	5.7	29.731		" "
8 "	29.892	84.5	84.6	78.2	6.4	29.742	N.W.	"
9 "	29.906	85.8	85.5	77.8	7.7	29.752	"	"
10 "	29.900	86.3	85.8	78.8	7.0	29.744	"	" Fresh breeze.
11 "	29.892	86.9	86.4	78.8	7.6	29.736	"	" " "
0 "	29.872	87.2	87.1	77.8	9.3	29.715	"	" " "
1 "	29.844	87.2	86.9	77.0	9.9	29.687	"	" Strong breeze.
2 "	28.820	87.5	87.2	76.0	11.2	29 662	"	" with " "
3 "	29.800	87.7	87.2	74.8	12.4	29.642	"	"
4 "	29 796	87.4	87.0	72.2	14.8	29.640	"	"
5 "	29.790	86.8	86.0	72.2	13.8	29.635	"	" Strong breeze.
6 "	29.800	85.2	84.0	71.3	12.8	29.649	"	" Gentle breeze.
7 "	29.804	84.6	83.1	77.8	5.2	29.654	N.E.	" Fresh breeze.
8 "	29.822	8485	82.9	74.6	8.3	29.672	N.W.	" " "
9 "	29.828	83.9	82.5	74.5	8.0	29.680	"	" " "
10 "	29.830	83.6	82.0	74.9	7.1	29.683	"	" " "
11 "	29.822	83.3	81.9	75.0	6.9	29.676	"	" " "
0 "	29.812	83.0	81.6	75.0	6.6	29.667	"	" " "
1 "	29.800	82.9	81.3	75.1	6.2	29.656	"	" with a few Cirrus.

Magnetic Observatory, Bombay, Colaba, Meteorological Observations, 23d May 1842.

Bombay Mean Time.	Standard. Barom.	Standard. Thermo.	Staud. Thermo.	Thermo. Dry	Thermo. Wet.	Differ-ence.	Correct. Barom.	Wind. Direc.	Wind. Force.	Remarks.
6	29								Gentle	
7	29.830	83.5	82.9	83.1	74.5	8.6	29.683	W.	..	Clouded.
8	29.840	84.2	83.8	83.2	75.0	8.2	29.689	S.	..	,, with light rain.
9	29.846	84.9	84.0	83.4	75.0	8.4	29.695	..	..	,, and no rain.
9½	29.850	85.4	84.8	84.0	75.2	8.8	29.699	..	..	,, ,, ,,
10	29.850	86.0	85.2	84.9	75.4	8.5	29.697	..	..	,, ,, ,,
10½	26.848	86.5	85.9	85.8	75.8	10.0	28.693	..	..	7-8ths Clouded.
11	29.840	86.6	86.1	85.8	76.0	9.8	29.685	S.W.	..	6-8ths ,, ,,
0	29.830	87.0	86.7	86.4	76.0	10.4	29.674	.	..	,, ,, ,,
1	29.820	87.8	87.6	86.9	76.5	10.4	29.661	..	.	7-8ths ,, ,,
2	29.808	87.9	87.6	87.2	77.0	1.02	29.649	..	..	3-8ths Cumulœstratus and Cumulus.
2½	29.796	88.2	88.0	87.9	77.6	10.3	29.637	..	..	,, ,,
3	29.778	88.5	87.9	87.2	77.5	9.7	29.618	W.by S.	..	Clear in the N., and W., 3-8ths Cumulœstratus
3½	29.778	88.3	87.8	87.2	78.5	8.7	29.619	S.W.	..	,, ,, ,, ,, ,,
4	29.768	88.2	87.6	87.2	78.8	8.4	29.669	..	..	Z. Clear 2-8ths Cumulœstratus and Cirrustratus in N. E. and S. with Cerri in the W.
4½	29.762	88.1	87.6	87.0	78.5	8.5	29.603	W.S.W.	..	,, ,, ,, ,,
5	29.762	87.9	87.4	86.8	77.8	9.0	29.604	..	..	,, 1-8th ,, ,,
5½	29.764	87.5	87.0	86.3	78.6	7.7	29.607	..	..	Zenith clear, Cumulus and Cumulœstratus in N. E. and S.
6	29.768	87.3	86.8	86.5	78.0	8.5	29.602	W.by S.	..	,, ,, ,, ,,
7	29.776	86.2	85.2	84.5	77.2	7.3	29.623	W.by N.	..	Clear with moonlight.
8	29.785	85.2	84.5	84.0	77.0	7.0	29.629	..	..	A few clouds in the east.
9	29.790	85.0	84.1	84.0	76.0	8.0	29.640	..	..	,, ,, ,,
9½	29.790	84.9	84.0	83.9	76.5	7.4	29 640	..	...	,, ,, ,,
10	29.796	84.8	84.0	83.8	76.2	7.6	29.646	..	..	Clear.
10½	29.796	86.7	84.0	83.8	76.2	7.6	29.642	..	..	,,
11	29.796	84.5	83.9	83.7	76.3	7.4	29.647	..	..	A few clouds in the S. and E.
0	29.786	84.4	83 8	83.5	76.8	6.7	29.637	..	..	5-8ths Overcast.
1	29.776	84.2	83.6	83.2	77.2	6.0	29.628	..	..	7-8ths ,,
2	29.764	84.2	83.6	83.2	77.5	5.7	29.616	..	..	4-8ths ,,
2½	29.764	84.2	83.5	83.0	76.8	6.2	29.616	..	..	6-8ths ,,
3	29.764	84.0	83.4	83.0	76.8	6.2	29.617	..	..	7-8ths ,,
3½	29.760	84.0	83.2	83.0	76.7	6.3	29.613	..	..	,, ,,
4	29.760	83.9	83 2	82.9	76.6	6.4	29.613	..	..	,, ,,
4½	29.772	83.9	83.0	82.9	76.5	6.4	29.625	..	..	,, ,,
5	29.788	83.8	83.0	82.8	76.4	6.4	29.641	..	..	,, ,,
5½	29.800	83.9	83.1	82.9	76.8	6.1	29.652	..	..	,, ,,

Magnetic Observatory, Colaba, Meteorological Observations, 21st June, 1842.

Bombay Mean Time.	Barom.		Stand Thermo.	Thermo.		Difference.	Correct. Barom.	Wind.		Remarks.
	Barom.	Thermo.		Dry	Wet.			Direct.	Force.	
A. M.										
6	29.526	82.6	81.6	81.6	79.0	2.6	29.383	W.S.W.	..	8-8ths Numbis.
7	29.534	82.2	81.8	81.2	78.6	2.6	29.392	W.by N.	..	,, ,,
8	29.566	82.2	81.4	80.5	78.0	2.5	29.424	W.	..	,, ,, Light rain.
9	26.580	82.8	83.8	82.3	79.1	3.2	29.436	..	..	,, ,, no rain.
9½	29.580	82.8	83.8	82.2	79.0	3.2	29.436	..	..	,, ,, ,, ,,
10	29.568	82.6	81.5	81.0	78.5	2.5	29.445	..	..	,, ,, light rain.
10½	29.588	82.6	81.8	81.0	78.8	2.2	29.445	..	..	,, ,, ,, ,,
11	29.590	82.6	82.3	82.0	79.0	3.0	29.447	W.by S.	..	,, ,, no rain.
0	29.590	83.0	82.6	82.2	78.0	3.2	29.447	..	..	,, ,, ,, ,,
1	29.580	82.6	81.2	80.0	78.5	1.5	29.436	W.by N.	..	,, ,, heavy rain.
2	29.580	82.8	82.8	82.0	79.5	2.5	29.435	W.by S.	..	,, ,, light rain.
2½	29.580	82.5	82.4	81.9	79.4	1.5	29.436	..	..	,, ,, heavy rain.
3	29.570	82.8	81.6	81.2	79.2	2.0	29.426	..	..	,, ,, ,, ,,
3½	24.570	82.7	81.7	81.0	79.0	2.0	29.427	N. W.	..	,, ,, ,, ,,
4	29.570	82.9	82.2	81.6	79.2	2.4	29.426	..	..	,, ,, light rain.
4½	29.560	82.8	81.8	80.8	78.0	2.8	29.416	N.	..	,, ,, no rain.
5	29.560	82.2	81.2	80.8	78.5	2.3	29.424	..	..	,, ,, ,, ,,
5½	29.566	82.2	81.2	81.0	78.5	2.5	29.424	S. W.	..	,, ,, ,, ,,
6	29.566	92.2	81.2	81.0	78.2	2.8	29.424	..	..	,, ,, ,, ,,

The above only extend over a period of twelve hours. Professor Orlebar left Bombay for Europe on sick certificate on the 1st of May, and his successor was placed in charge on the 15th of July; at this time there was only a single assistant in the Magnetic and Meteorological department of the Observatory: and without losing the day, before or after the term day it was impossible for him to attempt the consecutive hourly observations.

Art. X. — *Copy of the Asoka Inscription at Girnar.* By Capt. L. G. Jacob, and N. L. Westergaard, Esq.

The following inscription should have appeared at the beginning of this number, but it was thought advisable, to defer putting it into the hands of the lithographer, until Capt. Jacob could be consulted as to the mode of having it executed. The lithographed copy itself has unfortunately not had the benefit of Capt. Jacob's revision, but it is hoped, that it will be found to be a faithful transcript of the original. Another copy

has been transmitted by Mr. Westergaard to Professor Lassen, and will probably appear in Germany, with the advantage of a commentary by that celebrated orientalist. The original is deposited, for reference, in the library of the Society.

If any apology were required for publishing a correct copy of the most valuable historical monument yet discovered in India, it will be found in the following extract of a private letter, dated the 8th April, from Capt. Jacob, who devoted a long time to making and correcting the copy. Those who take an interest in the subject will find Mr. J. Prinsep's papers, and the Journal of Lieut. Postans' Journey, made by order of the Supreme Government, at pages 219, 334, 365 and 864, of the 7th vol. of the Journal of the Asiatic Society of Bengal for 1838.

"The History of the Girnar Inscription's copyings is first to be seen in Prinsep's Journal. You are aware of his attempt to obtain more perfect copies than those first made by Capt. Lang, at the instigation of our late President. For this purpose, Lieut. Postans was deputed to Joonaghur, who took infinite pains to secure exactitude, aided by Capt. Lang who was with him at the spot.

"These copies were forwarded to Calcutta, but reached as the ever to be lamented Prinsep was on the eve of departure from the land which his genius had helped to illumine. The MSS. and cloth copies rotted in the Calcutta godown. I gave a duplicate copy of the cloth copy to your predecessor at Postans' request, for the London (Parent) Society, but never could ascertain what became of it.

"I undertook to make fresh copies of these Inscriptions for the Calcutta people, and I had been engaged some time in the rock when Mr. Westergaard arrived in India. I gave him my present copies, and we went over them partly together at the rock. The old Asoka inscription you are now about publishing, was I think nearly faultless; but for the two published in your last number, you are indebted chiefly to our Danish brother's labours for the correct form in which they appear."

Southern Division of the American system on the Eastern half of the Cherokee Nation, forming

1st Districts.

[illegible]

[illegible]

[illegible]

2ª Divisão.

3ª Divisão.

ἐπεὶ δὲ τὰ τῶν Ἑλλήνων πράγματα ἐν τῷ μεταξὺ χρόνῳ ἐπὶ πλεῖστον ηὐξήθη, ἐπιθυμία μοι ἐγένετο τὰ κατὰ τὸν πόλεμον τὸν Πελοποννησιακὸν γενόμενα ἀναγράψαι, ὅτι μεγίστην ἐκεῖνος κίνησιν τῶν πρότερον γενομένων παρέσχε. τοῦτο δὲ ἐποίουν ἐκ τοῦ τοὺς ἀμφοτέρους τοὺς πολεμήσαντας ἀκμάσαντας ἐν τῷ πολέμῳ καὶ τὰ ἐπιτηδεύματα ἐπιγνῶναι ἐξ ἀρχῆς ἀκριβῶς καὶ τὰς αἰτίας δι' ἃς διεφέρθησαν. ἔστι δὲ ἡ μὲν τοῦ πολέμου τούτου ἀναγραφὴ Θουκυδίδου τοῦ Ἀθηναίου.

Thucydides.

ΘΟΥΚΥΔΙΔΟΥ ΤΟΥ ΑΘΗΝΑΙΟΥ ΤΟΥ ΠΕΛΟΠΟΝΝΗΣΙΑΚΟΥ ΠΟΛΕΜΟΥ ΑΝΑΓΡΑΦΗ.

ΚΕΦΑΛΑΙΟΝ Α.

ΘΟΥΚΥΔΙΔΗΣ ΑΘΗΝΑΙΟΣ ΞΥΝΕΓΡΑΨΕ ΤΟΝ ΠΟΛΕΜΟΝ ΤΟΝ ΠΕΛΟΠΟΝΝΗΣΙΩΝ ΚΑΙ ΑΘΗΝΑΙΩΝ, ΩΣ ΕΠΟΛΕΜΗΣΑΝ ΠΡΟΣ ΑΛΛΗΛΟΥΣ, ΑΡΞΑΜΕΝΟΣ ΕΥΘΥΣ ΚΑΘΙΣΤΑΜΕΝΟΥ ΤΟΥ ΠΟΛΕΜΟΥ, ΕΛΠΙΔΑ ΜΕΓΙΣΤΗΝ ΠΑΡΕΧΟΜΕΝΟΣ ΚΑΙ ΑΞΙΟΛΟΓΩΤΑΤΗΝ ΤΩΝ ΠΡΟΓΕΓΕΝΗΜΕΝΩΝ.

ΠΑΡΕΣΚΕΥΑΖΟΝΤΟ ΓΑΡ ΑΜΦΟΤΕΡΟΙ ΕΠΙ ΠΟΛΥ ΤΟΥΤΟ ΤΟ ΠΡΑΓΜΑ ΚΑΙ ΤΟΥ ΑΛΛΟΥ ΤΟΥ ΤΟΤΕ ΕΤΙ ΑΚΜΑΖΟΝΤΟΣ ΤΗΣ ΕΛΛΑΔΟΣ ΠΑΣΗΣ ΟΡΜΩΜΕΝΗΣ ΕΠΙ ΤΟΝ ΠΟΛΕΜΟΝ, ΚΑΙ ΤΩΝ ΑΛΛΩΝ ΤΩΝ ΜΕΝ ΕΥΘΥΣ ΕΝΘΕΝΔΕ ΠΡΟΣΧΩΡΗΣΑΝΤΩΝ, ΤΩΝ ΔΕ ΚΑΙ ΜΕΤΑ ΤΑΥΤΑ ΒΟΥΛΟΜΕΝΩΝ. ΚΑΙ ΓΕΝΕΣΘΑΙ ΜΕΓΙΣΤΟΣ ΔΗ ΟΥΤΟΣ ΚΙΝΔΥΝΟΣ ΕΔΟΚΕΙ ΤΟΙΣ ΤΕ ΑΛΛΟΙΣ ΚΑΙ ΟΣΟΙ ΑΥΤΟΥ ΕΠΟΛΕΜΗΣΑΝ ΜΕΓΙΣΤΟΣ ΔΗ ΟΥΤΟΣ ΚΙΝΔΥΝΟΣ ΕΔΟΚΕΙ ΤΟΙΣ ΤΕ ΑΛΛΟΙΣ ΚΑΙ ΟΣΟΙ ΑΥΤΟΥ ΕΠΟΛΕΜΗΣΑΝ

Fracture of the Rock

Northern Division of the Inscription on the East Side of the Rock Sheer commences

6th Division.

space for 9 lines

(no letters) (space for 2 lines)

ᐊᑎᓂᐱᓯᒪᔨᖅᑐᑦ ᓄᓇᕗᑦ ᐃᓄᐃᑦ ᐊᑐᓕᕆᔨᒃᑯᑦ ᐃᓄᐃᑦ ᑕᒪᓐᓇᐅᑉ

Else 2 letters apparently omitted in outline as I omitted often

11me Dimanche

12me Dimanche

13th Decium

Fracture of the mountain of mountains

Boutflag of mountains

Mountains

Rock

no more letters

no more letters

Perhaps one letter missing

no more letters

no more letters + Perhaps a letter
extremely doubtful

A single line

JOURNAL

OF THE

BOMBAY BRANCH

OF THE

ROYAL ASIATIC SOCIETY.

OCTOBER, 1843.

ART. I.—*Translation of an Inscription found at Nagpore; with a Fac-simile, and Transcript in Balbodh.*
By BALL GUNGADHAR SHASTREE, Esq.

Remarks on the historical value of the Inscription.

1. The accompanying Inscription, copied from a stone at Nagpore, was sent to me last year by Dr. Stevenson, to whom it had been transmitted by Mr. L. R. Reid. On examining it attentively, I found that, though copied with some care, it was inaccurate in many places; and besides wanting one or two lines at the commencement, had blanks in different parts, in which the letters must have been illegible on account of fracture or some other circumstance. The part omitted at the beginning, is, however, of no consequence in a practical point of view; for, since the two or three lines that follow contain the customary invocations, it could not possibly have reference to any other subject. In regard to the blanks, I have filled them up with such words as were suggested by the context; and it is highly satisfactory to find that with the exception of the name of one King, very little of the important part of the Inscription can be affected by any difference of opinion in regard to my conjectural readings, which, as admitting of doubt, I have distinguished with a mark of interrogation or enclosed within brackets.

2. It will be perceived from the subjoined English Translation, that

the Inscription contains a kind of eulogy on the kings of the Pramára family, written during the reign of Nara Varma, in the Samvat year 1161 or 1105 A. D. The race whose achievements it commemorates, is one of the four Agniculas, the account of whose birth or regeneration from the sacrificial fire of Vasishta Muni, as given by Col. Tod, is repeated in the 10th verse; though the motive assigned by the imagination of the poet to Vasishta for creating new tribes of Kshatriyas, is a desire of taking revenge on his opponent Vishwámitra, and not the general prevalence of heterodoxy and vice all over India.

3. The Pramáras (more properly Paramáras according to our Inscription) appear to have acted an important part in the history of the middle ages of India. I extract the following remarks from the authority just cited, regarding the extent of their territory, the names of the principal kings of their family, and the capitals to which their power was transferred at various periods.

"The Pramára, though not, as his name implies, the chief warrior, was the most potent of the Agniculas. He sent forth thirty-five *sachæ*, or branches, several of whom enjoyed extensive sovereignties. "The world is the Pramáras," is an ancient saying, denoting their extensive sway; and the *No-kote maroosthulli* signified the nine divisions into which the country, from the Sutledge to the ocean, was partitioned among them.

"Maheshwar, Dhar, Mandoo, Oojein, Chundrabhaga, Cheetore, Aboo, Chandravati, Mhow, Maidana, Parmavati, Omrakote, Bekher, Lodurva, and Puttun, are the most conspicuous of the capitals they conquered or founded.

"Though the Pramára family never equalled in wealth the famed Solanki princes of Anhalwarra, or shone with such lustre as the Chohan, it attained a wider range, and an earlier consolidation of dominion than either, and far excelled in all, the Purihara, the least and last of the Agniculas, which it long held tributary.

"Maheshwar, the ancient seat of the Hya kings, appears to have been the first seat of government of the Pramáras. They subsequently founded Dharanagar and Mandoo on the crest of the Vindhya hills; and to them is even attributed the city of Oojein, the first meridian of the Hindus, and the seat of Vicrama.

"There are numerous records of the family, fixing eras in their history, of more modern times; and it is to be hoped that the interpretation

of yet undeciphered inscriptions, may carry us back beyond the seventh century.

"The era of Bhoj, the son of Monj, has been satisfactorily settled; and an inscription in the nail-headed character, carries it back a step farther, and elicits an historical fact of infinite value, giving the date of the last prince of the Pramáras of Cheetore, and the consequent accession of the Gehlotes.

"The Narbada was no limit to the power of the Pramáras. About the very period of the foregoing inscription, Ram Pramár, held his court in Telungana, and is invested by the Chohan bard Chand, with the dignity of paramount sovereign of India, and head of a splendid feudal association, whose members became independent on his death. The bard makes this a voluntary act of the Pramáras; but coupled with the Gehlote's violent acquisition of Cheetore, we may suppose the successor of Ram was unable to maintain such supremacy.

"While Hindu literature survives, the name of Bhoj Pramára and 'the nine gems' of his court cannot perish; though it is difficult to say, which of the three princes of this name is particularly alluded to, as they all appear to have been patrons of science.

"Chandragoopta, the supposed opponent of Alexander, was a Mori, and in the sacred genealogies is declared of the race of Takshac. The ancient inscriptions of the Pramáras, of which Mori is a principal branch, declare it of the race of Tusta and Takshac, as does that now given from the seat of their power, Cheetore.

"Shalwahan, the conquerer of Vicramaditya, was a Takshac, and his era set aside that of the Tuar in the Dekhan.

"Not one remnant of independence exists to mark the greatness of the Pramáras; ruins are the sole records of their power. The prince of Dhát in the Indian desert, is the last phantom of royalty of the race; and the descendant of the prince who protected Humayoon when driven from the throne of Timur, in whose capital, Oomerkote, the great Akbar was born, is at the foot of (the) fortune's ladder; his throne in the desert, the footstool of the Bulotch, on whose bounty he is dependent for support.

"Among the thirty-five Sachæ of the Pramáras, the Vihil was eminent, the princes of which line appear to have been lords of Chamravati, at the foot of the Aravulli.

"The Rao of Bejolli, one of the sixteen superior nobles of the Rana's

court, is a Pramára of the ancient stock of Dhar, and perhaps its most respectable representative.*"

4. As the preceding passage is almost the only one in the Annals of Rajesthan, which has an exclusive reference to the Pramáras, I have taken it entire to shew the result of the investigations of Col. Tod in regard to this family. I may state that those of the events mentioned by him, which relate to the whole of the period antecedent to the eleventh century of the Christian era, appear to rest almost entirely on tradition, the only written documents discovered before the time he wrote, being three copper-plate grants found at Ujjayani, two bearing dates between the *Samvat* years 1192 and 1200, and one without date.† After acareful examination of their contents, Mr. Colebrooke considers them as authenticating the following series of kings; viz, Udayaditya Déva; his son Nara Varma Déva; his son Yasho Varma Déva; and his two sons Jaya Varma Déva, and Lakshmi Varma Déva; the reigns of these princes extending from the latter part of the eleventh century of the Christian era to near the close of the twelfth. Col. Tod carries the line retrospectively on the authority of the *Madhu-caraghar* Marble and *Bhoja Charitra*, and places the names of Sindhu, Munja, Sindhula and Bhoja, before that of Udayaditya, the earliest king mentioned in the Ujjayani Plates.

5. A copper plate-grant, dated Samvat 1267, was found at Piplianaggar, in the territory of Bhopal, by the late Mr. L. Wilkinson, the Political Agent at that place. The inscription upon it, which appears with a translation by him in the Journal of the Asiatic Society of Bengal for July 1836,‡ brings down the genealogy to the beginning of the thirteenth century of Christ; following the prince, last mentioned in the Ujjayaní plates, with the names of Vindhya Varma, Amushyayana, Subhása Varma and Arjuna; and, as the late Mr. Prinsep observes in a note upon it, "exactly filling up the blank between the former prince and Birsal in 1220." This document also mentions Bhoja, as being the father of Udayaditya, confirming the last of the three names, prefixed by Col. Tod to the Ujjayaní list, on an authority which might be regarded as not altogether decisive. § Another copper-plate grant, found in the

* Annals. of Rajesthán Vol. I. p. 91.

† Trans. of the Royal Asiatic Society. Vol. I. p. 231.

‡ See page 377.

§ Two other grants by this same king, Arjuna, dug up at Piplianaggar, ap-

same locality* by Mr. Wilkinson, supplies the name of Harrischandra Déva, the son of Lakshmi Varma, the brother of Jaya Varma. This is dated Samvat 1236, or A. D. 1180.

6. The Nagpore Inscription, now brought to light, contains, as before observed, an eulogy written by order of Nara Varma in Samvat 1161, or A. D. 1105, descriptive of the glory and achievements of his ancestors, and particularly his brother, Lakshmídhara. It will appear to be a document of some historical importance, as it confirms the names of Udayáditya, and his father, Bhoja, mentioned in the various records above referred to, and supplies the names of Bhadra Rája, Bhoja Rája, Bhimaka, and Vairi Sinha, ascending upwards from Bhoja in a reverse order of time, and carrying the line about 80 years backwards, or to the year A. D. 965, at an average of twenty years to the duration of each reign. These names, arranged in the order of time, and connected with those already found in other grants, will stand as follows.

1 Vairi Sinha.
2 Bhímaka (his son.)
3 Rája Rája or Bhoja Rája† (his son.)
4 Bhadra Rája (his younger brother.)
5 Bhoja Déva (his son.)
6 Udayaditya (his son.)
7 Lakshmídhara (his son.)
8 Nara Varma Déva (A. D. 1105 his brother.)
9 Yasho Varma Déva (A. D. 1137 his son.)
10 Jaya Varma Déva (his son.)
11 Lakshmi Varma Déva (his brother.)
12 Vindhya Varma (son of Ajaya Varma.)
13 Harrischandra (A. D. 1179 son of Lakshmi Varma.)
14 Amushyayana (son of Vindhya Varma.)
15 Subhása Varma (his son.)
16 Arjuna (his son A. D. 1211.)

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pear to correspond with this, word for word, one later by three and the other by five years.

* See page 736, Journal of the Asiatic Society of Bengal for August 1838.

† The first syllable being a blank, either रा, भो, or any other letter may be supplied. This is the exception alluded to in para. first of this paper.

It must be noticed that in this enumeration, we see nothing of Sindhu, Múnja, or Sindhula, placed by Col. Tod before the 5th Prince on the authority of Bhoja Charitra, &c.

7. Though we have two Bhojas in the above list, neither of them can, for a moment, be supposed to be identical with the famous patron of the "nine gems;" for had either been a lover of literature to any extent, the writer of our Inscription, who does not appear to have much regard for truth when exalting the merits of the ancestors of his master, would surely never have omitted to take due notice of such an agreeable topic. The theories of Mr. Bentley and Major Wilford, the former of whom places the reign of Rája Bhoja between the years 982 and 1082 A. D. and the latter supposes the death of that prince as having occurred between 977 and 982 at the latest,* appear, therefore, to have been shaken to the base by a clear and forcible evidence, the existence of which could not have been imagined at the time those distinguished orientalists wrote.

8. The records of the Pramára kings, already collected, are also quite sufficient to shew how little reliance ought to be placed on the genealogies of the Hindu kings, given by Abul Fazil in the Ayeen Akbari. In his list of the Malwa kings, quoted in Mr. Prinsep's Chronological Tables,† it is difficult to identify even half of the names contained in the preceding catalogue.

9. In such a hyperbolical eulogy as the accompanying, no particular importance can be attached to any of the exploits assigned to the elder Pramáras, or to Lakshmídhara. But the defeat of Karna, king of the Karnatica, by Udayaditya; the conquest of Tripura by Lakshmídhara and his victories over the Angas, the Kalingas, the chieftains of the south as far down as Rama's bridge, and those of the north as high as the country of the Turushkas, on the banks of the river Vanku, some stream perhaps in Káshmír, may be particularized as shewing the great extent of the resources of the Pramáras at the period under investigation.

10 The villages granted by Lakshmídhara, and confirmed by his brother and successor Nára Varma, are mentioned as being situated in the province of Vyapúr. The site of this, I am unable to fix. I may,

* See Asiatic Researches, Vol. VIII. and preface to Wilson's Sancrit Dictionary, page vi.

† See Appendix to the Bengal Asiatic Society's Journal for December, 1835.

however, offer a conjecture on the subject. Nagpúr, means a town of serpents, and is very frequently known to the learned among us by the synonymous epithet of Vyálapur. It is not improbable that the ancient name of the place was Vyápur, and that some influential individual or chief changed it into the more significant appellation of Vyálapur. The successors of Nara Varma appear to have reigned in Mandap and Nilagiri, which affords a proof in favour of Col. Tod's long list of the Pramára capitals.

11. The language of the Inscription, is, as above remarked, extremely pompous and figurative, quite characteristic of the age in which it was written; though considered very elegant according to the modern perverted notions of our writers, who, like the author of this eulogy, do not even scruple to exalt their heroes above the gods, by employing childish plays on words and other similar artifices. There is scarcely a single couplet in which we have not one or two words employed in a double meaning. Its hyperboles, metaphors, and mythological allusions, are so far-fetched and unnatural, that, notwithstanding all my pains, I fear, some of them may yet be found unintelligible to a mere English reader.

12. The character, in which the Inscription is written, is what Mr. Prinsep calls "Kutila" or crooked, a name given to it in one of the grants of the middle ages discovered by him. A line or two at the bottom appear somewhat different from the rest, the form of the letters being evidently ornamental. The character, on the whole, is nearly the same as that of the Khárepátan grant, and I need not therefore, describe it any further.

Translation of an Inscription found on a stone at Nagpore.

[The transcript begins with a part of a sentence, from which circumstance and from the absence of the usual invocation, it appears that the first line of the Inscription has not been copied or had been effaced]. O Goddess! may we be blessed with openness, generosity, sweetness, deep meditation, and equanimity, which attributes belong to you; and [O Sarasvatti, (the goddess of speech) do thou also inspire me with thy attributes, simplicity, elegance, unity, and harmony.[1]] May the lord of Lakshimi, who is without a second in the three worlds, be propitious to

1 Wherever a simile or contrast is expressed by a play upon words, I have distinguished their secondary sense by using brackets of this kind. [ ]

you (mankind). The sun and other luminaries shine forth, having an asylum in his imperishable heaven. May good poetry, which abounds in Játi and other kinds of metre, as well as in the figures of speech, pathetic sentiments, and other ornaments, be propitious to us; [resembling virtuous and learned men descended from a good race, possessed of noble accomplishments, and capable of feeling poetical charms. May Shiva, who is formidable to the towers of his insupportable enemy;[2] who adorns himself with ashes, and to whom Kubera does homage, grant you happiness, like the Agni race [which is terrible to its foes, is adorned with prosperity, and honoured by the kings of kings]. Glory to the lotus-seated Brahma, who, like pearls, is produced in the hollow of this oyster-like mundane egg, and is honoured by Mahesha [as pearls are by rich men]. May we be blessed with enjoyment and beatitude by the awful and noble figures of the lords of Umá and Ráma, one of whom delights in an utter absence of worldly desire, a wreath of human skulls, skins of tigers and elephants, and a sprinkling of ashes; while the other indulges himself in passion, and takes pleasure in garlands of flowers, apparel, necklaces, and fragrant ointments. May Vishnu be propitious, who, like a universal car, has created this universe without being different from it, to maintain the Karma Mímansa Philosophy? There is a noble mountain, named Abu, which mocks the pride of the lord of the mountains (the Meru) by its lofty summits, and resembles the blue firmament by its brows composed of sapphire. The circle of the lotuses, waving in lakes on its sky-reaching-peaks, may be compared to a fragment of another mundane egg. Brahma, being desirous of ascertaining whether the abode of the gods or that of men was purer,[3] suspended to the two extremities of this mountain, which, methinks, resembles a true balance, the heaven inhabited by gods, and the earth peopled by human beings; when the former went up in consequence of the pillar-like celestial mountain, and hence was proved to be endowed with greater purity. This Abu aspires to the beauty of the universal car, which has the earth and the heavens for its two wheels, connected by an axis, reaching, on the one hand, the expanse of water, and, on the other, the confines of space, and appears bending in this rugged career of life, by being impeded

2 Tripurásura.

3. This alludes to the ancient Hindu custom of testing the character of a man by weighing him. Being lighter was always regarded as a proof of honesty or innocence.

in the regions of the stars. On this hill, whose green and pleasant brows were overflowed with the waters of the celestial streams, resided the Muni Vasishtha, the chief of those versed in the Vedas; who, obedient to his father (Brahma), carried to the upper portion of the mundane egg the river Yamuna, in the form of smoke proceeding from the sacred triad of fires, in order to effect a junction with the (celestial) Ganga. His precepts, like guides, extricate the car-like triad of the worlds, when, pursuing a wrong direction, it sinks into the quicksand of temporal affairs, bordering on the great stream of knowledge. Once on a time when Kanshika (Vishwámitra) paid a visit to the forest, and was endeavouring to carry away the cow Nandiní, who had delighted him by producing every thing necessary for his entertainment, the enraged Muni Vasishtha propitiated the fire by his offerings, and from it came forth Paramára, the true conqueror and slayer of foes. His family became an image of those of the sun and moon; that, assuming humility and delighting in huge armour, faithful banners, and great renown; [these glorying in having given birth to Rághava, Vishala-Varma, Satya Ketu, and Prithu.] That is invincible to the race of the immortal gods, is produced from fire, and fond of (polite) assemblies; [these gave birth to the kings, Aja, Ráma, Nalla, and Bharata.] In this race flourished the king Vairi Sinha, on whose royal birth, prosperity, prowess, imperial dignity, generosity, and courage, shed a lustre; while the space before his throne was strewed with gems and rubies, dropped from the crowned heads of kings, who constantly attended his court to do him homage. While he was marching to conquer the remotest quarters of the globe, the regions of space, filled with umbrellas of peacock's feathers shining like emeralds, appeared as if choked up with the poisonous respirations proceeding from the exhausted Shesha,[4] trembling under the load of the earth, which was oppressed, under the feet of the marching train of his lusty elephants. His fiery and immortal spirit still survives in the subterranean regions in the person of the Vádava fire; on the earth, in that of the golden mountain; in the heavens, in that of the starry firmament; and in the horizon, in that of the gold-coloured arch. He ruled the earth, shaming Indra in heaven by his prosperity; defeating the army of his foes in hostile lands by his prowess; and surpassing, by his support of the earth, the lord of the serpents in the regions inhabited by those beings. From

4 The great serpent that supports the earth.

him was born king Bhíma, who gave a new face to the earth; whose wrath was cooled by tears flowing from the eyes of the widowed families of his enemies; and the flame of whose valour is still visible in the starry firmament, sending down its smoke in the shape of the blue sky. The clusters of pearls, projected upwards from the foreheads of the elephants slain by him, though falling down in the shape of stars, have not yet reached the earth. Here is a great marvel; to whom shall we relate it? Who will believe it? This king, though he supported the earth, earned extraordinary Lukshimi (wealth), and assisted the pure-minded, did not resemble Vaikunth (Vishnu) [as he was always irresistible.] His son Shri-Rája Rája (or Bhoja Rája), acted as the Pinak-armed god (Mahádeva) to the towers of his enemies; and his fiery spirit, with a desire of protecting this globe, has overspread it in the form of the mountain Lokáloka [5]. Even in his pleasant excursions, his armies covered the earth; the dust, raised by his cavalry, obscured the horizon; and the noise of the chains rattling on the march of his elephants, filled the concavity of the basin of the universe. His foes, when they were transformed into gods on being slain by his sword, and saw their headless trunks surrounded by armed men, became impatient to descend from their celestial chariots to combat new heroes, but the heavenly virgins encircled round their necks and held them back from returning to the earth. His younger son, the renowned Shri Bhidra Rája, was endowed with a fiery spirit, akin to the blazing Vádava, and slew his enemies, brandishing his sword like a stream, tossed about by a strong gale of wind. The dust raised by the march of his cavalry, assumed the appearance of smoke, which, methinks, may be compared to that of the all-devouring fire, as if the same proceeded through excavations made into the earth by his elephants. His foes regarded him as endowed with the profundity of the ocean, as manifested at the annihilation of the world; the might of the world-destroying wind; the stability of the lord of the tortoises, that supports the earth; the spaciousness of the basin of the universe; the brilliancy of the world-consuming fire, and the magnitude of the celestial vault. The throne of his son Shri Bhoja Déva, who, occupying the pinnácle of royal greatness, peculiarly adorned this world, was the only refuge to those, who, having lost their kingdoms through envy, were obliged to do him homage by lower-

5 The mountain supposed to mark the confines of the universe, or the space illuminated by the sun's rays.

ing their heads before his lotus-like feet, which were kissed by the lustre of the gems composing their crowns. (The next verse, which describes the train of the elephants of this king, is rather unintelligible). In the recitation of his praises in the assembly of the gods, Vikuntha (Vishnu) envies the four-mouthed Brahma; this god is jealous of the five-mouthed Hará, who cannot bear to see himself surpassed by his six-mouthed son. This commander of the heavenly host again grieves, when he sees the superior eloquence of the chief of serpents, endowed with a thousand mouths. This king having attained the companionship of Indra, the state was involved in dissentions in consequence of being deprived of its sovereign; and at such a period came into the world his son Udayáditya, who subverted the king Kanrá of the Karnátaka, that had harassed the earth; imitating thereby the achievement of the great Boar. Though the groups of his foes, overcome by the dazzling sun of his glory, met a noble death from him on the field of battle, they derived full satisfaction, when they pierced [6] the orb of the day-star, mistaking him for their enemy in the heat of their revenge. The lord of the serpents having witnessed his victories on a day of battle, closed his eyes in a transport of joy; by which he was deprived of the gratification of hearing his praises recited, and the hopeless creature severely reproached his huge body, which performs the function of hearing by the organ of sight. Shri Lakshma Déva, the son of that light of the three regions, imitated Prajápati, by devoting himself to the protection of his subjects, and, following in his conduct the ethics of Manu, obtained for himself an imperishable renown. His marching drum, methinks, meant to proclaim, "O lord of the tortoises and others! give ye your combined support to the earth, oppressed under the load of this army. O hostile kings! humiliate yourselves quickly, or you will be ruined. O immortals, whose eyes have no power of twinkling, close ye your eyes, or they will be covered with dust,". As soon as he began his march, the kings of the east deserted their brothers and relations to save themselves; those of the south were so terrified that they had no great hopes even of their lives; the princes of the west abandoned all hope as deceitful; while the chiefs of the north, in order to avert death, resolved to forsake enmity. When this prince,

6 This alludes to the belief of the Hindu warriors, that all those who die in the field of battle, penetrate the orb of the sun and pass to the higher regions.

with a view to procure noble elephants, invaded the eastern quarter of the globe, presided over by Indra, fear took refuge in the capital of the king of Gauda, as did Indra in heaven with his celestial companions. Having conquered Tripuri in a campaign, resembling an ordinary excursion of pleasure on some occasion of joy, and having annihilated his enemies, he spent (some time) on the banks of the Godávari; covered with pleasure gardens and hills, the beauty of which was enhanced by gentle breezes blowing over rivulets. In that sacred stream, whose waves were constantly bent upon undermining the hills on its banks, the elephants of the king plunged themselves, as if to expiate the sins committed in battle. These animals being in their rut, demolished the lower sides of the Vindhya mountains, mistaking them for the elephants of the enemy; as torrents rolled down from them in the disguise of trunks, while their lofty summits resembled frontal globes, and clouds covering their heads threw down a sprinkling of rain, in the form of the temporal juice. While the king was crossing these mountains, the hoofs of his fleet horses operated as a hatchet upon the rocks hardened by the action of water; while a horde of innumerable wild elephants, incited by the odour of the temporal juice, oozing from his elephants, sprang up and rambled through the forests. The elephants of Anga and Kalinga retired from the field of battle, when they beheld those of Shri Lakshama Déva, claiming a connection with the guardians of the light cardinal points and the love of their mistresses, and boasting of a companionship with the regents of the clouds. The praise of being the first of Purushas (men,) and the asylum of Shri (the goddess of wealth,) as well as that of having supported the earth, and protected it from the Bala Vairi (7) (the enemies of Indra), is said by the learned men to be peculiarly due to Vishnu; but this is an exaggeration. The billows of the sea, which reach the sky and the clouds at the world's destruction, and are the companions of glooms, covering the universe at that period, yielded in height to the elephants belonging to the vassals of Lakshmídhara, when they plunged themselves into the sea. (The next verse which follows the same idea is very obscure.) Those pearls which dropped from the golden girdles of the ladies of his vassals, while bathing in the sea, bestowed upon the waters of the Tamraparni, their peculiar quality (of

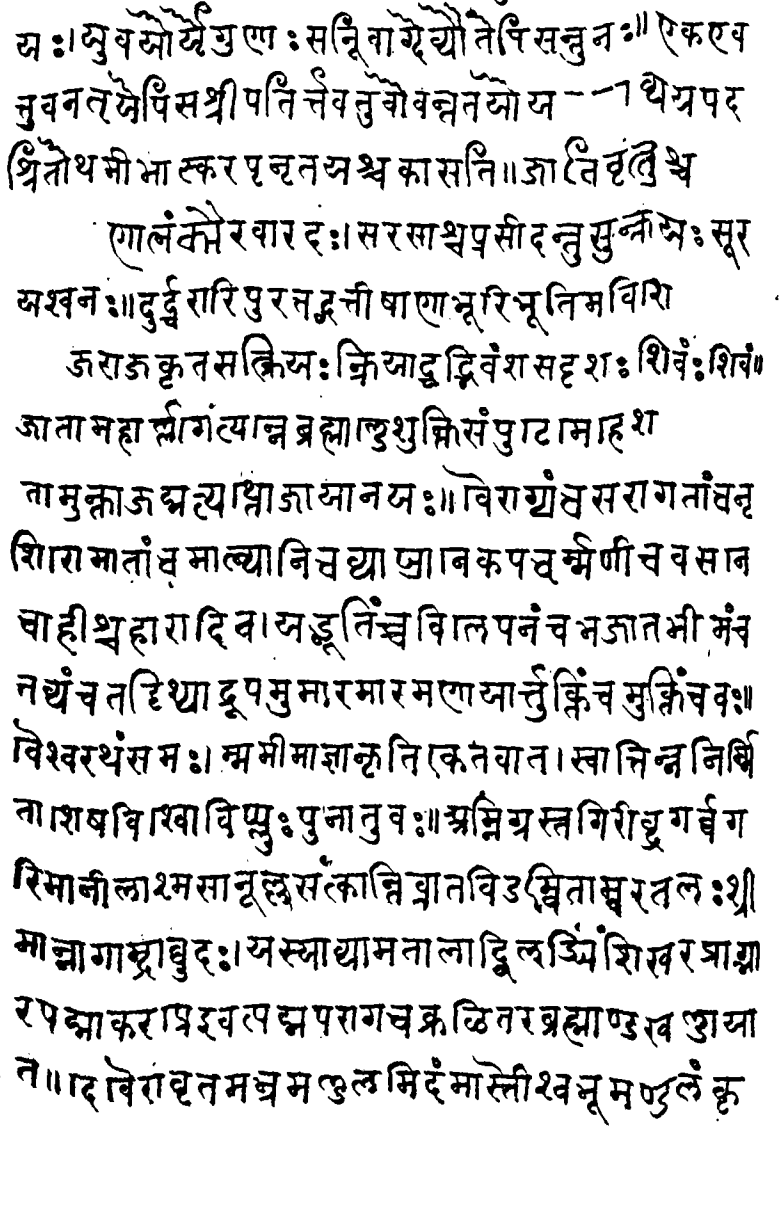
7 This word, used in reference to the king, signifies powerful enemies, and as all the epithets are thus applicable to him, the assertion that the praise is peculiarly due to Vishnu, is represented to be an exaggeration.

producing pearls,) which contributes to the support of the king of the Pandyas. This Lakshmídhara on being informed that he had reached the bridge, constructed with hills and huge rocks by Máruti and the other attendants of Ráma, when about to cross the sea, gave no heed to the statement, and formed a bridge of the elephants composing his retinue, as if to invade some other island in the ocean. No sooner had the shouts of the van of his three-divided army reached the point guarded by Yama (south), than the regent of the west, though holding a snare in his hand, became hopeless in regard to the protection of his post from the impending calamity. While the elephants of the king were quietly drinking up the waters of the ocean, each taking one draught, like Agasti, there is no telling where fire, the fishes, or the Mainak and other hills were. As to Hari, he must have been asleep. None of these knew what was taking place. The Mainak and other hills with large fishes, served as boats to the marching army, consisting of elephants adorned with pearls, which assumed the swinging motion of the Mandara. (8) When this king, being jealous of the Yakshas, marched towards the region guarded by Kubera, the people of that quarter abandoned their dwellings [as well as their riches]. In his gardens, he reared, like Punnaga, Areca and other trees, the plant of fame, which was watered by the sweat dropping from the crowned foreheads of kings, whom his victorious arm, eminently skilled in the use of the sword, had humbled. After having rooted out Turuṣkha Datá (a Turkish chief) by his victorious arm, he resided on the Vanku, whose banks were covered with saffron. He then caused his favourite parrot to be taught to recite his praises in a mellifluous voice, resembling that of the goddess Sarasvati. On the occasion of a solar eclipse, this victorious king, impressed with pious motives, duly bestowed (upon Brahmans?) two villages in the province of Vyápur, and these were exchanged for another, called Mokhala Pátala, by his brother Nara Varma Deva, with a view to secure eternal good. This king Lakshmídhara, caused this temple to be constructed, with figures commemorating his numerous exploits. In the Vicrama year 1161.

O learned men, be of good cheer, and examine our sweet composition with an acute eye. I bow to that audience, which sheds tears of joy at the charms of poetry.

8 The mountain with which the ocean was churned by the gods.

Fac-simile of the Inscription.



त्वावर्म्मतुल्यमानवपुषाञ्चस्यान्नस्यर्य्यस्यच। ज्ञानं
यावदवेतुमिच्छतिविविः किंशुद्धमित्यतायारूढंतावदगा
दमत्तीशिखरिस्तम्भान्नातामण्डलं॥ लोकत्रितयविस्तृतञ्च
विप्रविभूमिचक्रमाकाशचक्रमपिस्मनदिगन्तानिधि। सं
सारवर्त्मनिमहाविषमनिषन्नत्राणाद्यातिकतरविश्वन
धाकृतलकृमीः॥ तस्मिन्वरविहंवरः सत्तगवानाकाशग
ङ्गापयः प्रस्पुरितकान्नाकामलताटतिश्वद्वसिष्ठामुनिः।
यास्तवानलधूमवर्त्मिस्यमुनाप्रीत्येपितुव्रताएगङ्गास
द्मसिद्धास्यसमनस्यब्रह्माण्डखण्डप्रति॥ विद्यामहास
रिदुपान्नविवर्त्तिप्यारसंसारासेकतविषद्रुमसक्त॥ मा
तायस्यतिलोकरक्षमुत्यपसंप्रवृत्तमुत्तारयन्निशताशाथुङ्क
टशनुस्याः॥ श्रीमतस्यकटावनक्षितिपातरक्षितः कोशि
कस्यातिख्यातिवधूजातजननादानदिनीनदिनी। निर्जिता
कुपितनतनहविषासंहर्षिताद्दर्हिषावीरः श्रीपरमार
स्त्यनुपमः सत्यात्तिक्षानातवत्॥ राघवचरितविशालवम्म
वृत्तसत्याकतुपृसकीर्त्तिपार्थिवः। वर्द्धितस्यमहिमांशुचन्द्र
मःसततिप्रतिकृतिर्यदन्वयः॥ वराजराजराजिताना
लाद्भवः सत्तारतः। ग्राहन्नचक्रायारिवधजातस्यम
न्वयः॥ ६ ६॥ वंशस्मिन्वैरिसिंहः क्षितिपतिरतवद्भू

रिभूतिप्रतापवशगाक्षोदाक्षी शौर्यप्रचयपरिचयप्राप्तासो
राज्यसिद्धिः। नम्रक्ष्मापालमौलस्खलदलितलुलत्कानकाटी
राकोटितुरंगाणिक्यचक्रसुघटितमणिमत्पादपीठगण
कलृप्तः॥ सद्वीशाविजयप्रयाणसमयायास्यन्नृनीलप्रते
र्भीयूरातपवारणैः शुशुनिरन्नष्टावकाशादिशः। सद्यन्म
त्तकरीन्द्रचक्रचरणप्राग्भारदीर्णक्षितिरागच्छद्भूतविपन्नाग
पसविषश्वासावरुद्धाऽऽच॥ पाताल वडवामुखानलमिषा
त्पृथ्वीतालच स्फुरात्मोवल्लीचलकेतवादिशतिच ब्रह्मा
खण्डोच्छला -- च्चलाश्वनचक्रवालंवलयाद्याऽऽच्छदिग्
गुलयत्याद्यापित्तनुल्लत्तत्यविचलीत्तनःप्रतापानलः॥
स्वार्क्षाकपुरविद्विक्षितिपुरद्याल नृगाहपुरस्वाराऽं
चरिपुव्रजंचनुरऽिन्वागाविराऽंचयः। ऐश्वर्य्यणचवि
क्रमेणचयरात्तारकृगालगचन्यकुर्व्वेयपरात्तवश्चसमतिक्रा
मंश्चपृथ्वीमघात्॥ २९॥ तस्मादेरिनृपालवनवज्रोचेवथदुः
खाद्भवद्वाथाभ्रफणशन्नाकापदहनः श्रीत्तीयाकात्तनृ
पः॥ श्राविनावितनूतनस्मितिरयंब्रह्मा खण्डोच्छलद्यस्याद्यापि
बिलंक्रान्तविश्वहावेवभ्रमः प्रतापानलः॥ अनुगगनमुद
सूःस्थलमुत्क्राच्चयालयदनिदलितकुष्टाकुक्षिकुम्भस्थू
लस्यः। सततमपिपतन्नास्तद्यावन्नपृथ्वीपृथुलतरलता

राद्याऊभाजानऊजान्नाऋत्याथ्वर्यमदृभमथुनमिदंकास्मैसमा
त्तरुनाहाकाव्वतत्प्रतिपद्यानच्चतदपिप्रमूस्यानकोतुकात्सनुहृ
त्यापिवसुंवरामसदृंशीलक्ष्मपिलक्ष्मीचयःकुर्वंकार्यमान
कशःसुमनसामागान्नावेलुप्तां॥ ॐ तस्मादुरिवपुसि
नीवदविवप्रारव्वलुयधरप्रवंसेकपिनाकपाणिरजनिश्रा
ऊराजानृपःप्राज्यःप्रावृतवाल्पिपालक्षिपत्यासत्यप्र
तापाग्नालालाकालाकमहामहीव्रवलयद्याजाब्धहीमणु
लं॥ अस्मिन्सर्प्पतिलीलयापिललिते:सेन्यैसमुद्भूद्भि
तवाहथहविसारिव्वलिपटलद्यालुपृटिग्मगुलिः॥ अयइ।
नृकरीलृदयपटाप्रारवालानाहृदयलाप्रदवहृदवलनारनि
र्प्परचृतब्रह्माणुमाडादोरः॥ अन्निस्तृंशनिरस्तमस्तकत
मालक्षून्यघाडलैत्तावलस्वकवन्वनुदृतमाक्षदृष्टाना
टे॥ व्वपृितंसंहषांत्यतान्वविमानशिखरादाग्निघ्रकाग्रहन
दीरानसररागिणानुपुविरसचूजसिद्धनाः॥ ॐ॥त
स्यासीदवपार्विवःपृथुयशाःग्रीत्तिदराजानुजःस्फूर्
द्दाडवपावकस्फुट हःसादरैरोसानलः॥ अःसंग्राम
युगान्नवंल्लितभुजाबुर्वातदारार्ब्बसत्कालानाम्नितमणुल्य
ग्रप ल मदूअङ्गनतः॥ व्रडातिऊम्निनिजतामितऊजात
नऊजनरलतुरंगावागाद्भूतनूरणराजिः॥ विकंटकरटि

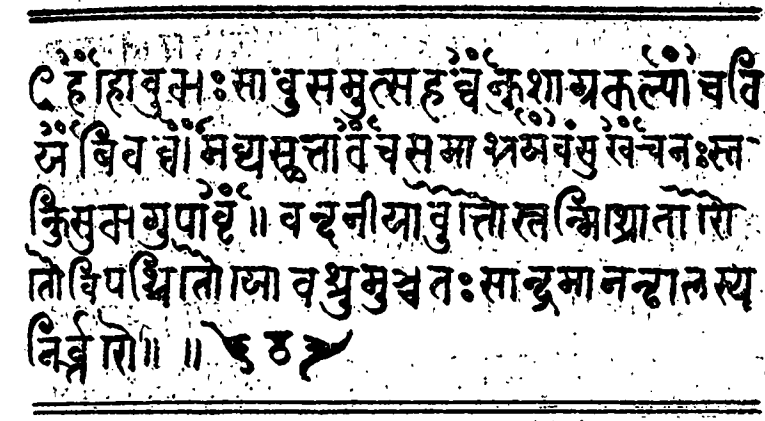
त्तारत्तपत्तूपृषुरङ्गदुरितस्वरायत्तादन्तकालग्निवूमः॥
गाङ्गीयपूलयार्णवस्यचवलेकल्पान्तवातस्यचासूगानंकमाठ
शितु---रता----भाऽस्यचातऊः कालहुताशनस्य
चमहीयसंद्यावचक्रस्यचस्वीकृत्यवविनिर्भिनत्यमवि
दुःप्रत्याजिपृथ्वीनुऊः॥२५२॥तत्सूनुस्तुवानेकत्तूषणमतू-
दुपालचूडामणिः॥च्छायाडम्बरतस्वितांद्विकमलः श्री
नाजाटावाठप-त्यस्याद्यपमम-यन्निचरणोरात्रा
सनाद्वासिनःसार्द्धवन्वविनम्रनिर्हुरनटात्कोटीराकोटि
त्विषः॥रटंत्सटटपाटवप्रकटभ्रजारस्फूर्जितस्फुर-भः
डम्भारादुमरडिण्डिमाडामरा।स्फुटत्कटनुसूरप्र
पदसंपतत्संयमन्मद्भुवन-त्तल-गरय-मनुच्चा
कः॥विनुजःकमलासनाद्यचतुरास्याद्यस्वयंतुःपुनःप
च्चास्याद्यहराद्यशम्भुरपिषद्दक्षाद्यपुत्राद्यच।सनानीरपि
दन्द्यूकपताद्यऊसंसहस्यमनाद्याद्यापिस्पृहल्यभ
र्त्यसमिवाद्य-र्लिनुत्कीर्त्तयन्॥२५८॥तस्मिन्वासव
चउतानुपगतिराद्यचनुल्यानुकालमप्रश्नाभिनितस्यव
नुवुदयादित्यातवद्भूपतिः।दानाहृत्यमहाक्षताप्रग
णितक्लाटकर्ल्लप्रभृतीपालकदर्वितांनुवमिमांश्री
मद्राहाखितं॥२५॥स्मादुग्रतरप्रताप--मणिवूटद्यु

दृर्शतासादरपक्षरविन्नमादनिमुरवः प्रापच्छिखेःपश्चता।
मान्यासायभिति प्रतीतिचित तामर्षप्रकार्षण त्तज्जित्वात्ता
स्करमण्डलैरिपुत्तज्ञः प्रापुःपरां निर्वृतिं॥ एकस्यांत्तभिते
विाला कृविऊर्जस्य॥स्यापरस्यांस्तुव---वक्रतांसम-
र्घयतिदृग्भिहसतसहाआकिंवानदृनिमीलितकृण
तआश्रोतेःसुखिर्वश्चिनग्रजःकर्लमकर्लमथहिपतिः
सीयंवपुश्चिश्चति॥२९॥पुतस्तस्यऊगत्वाऽेकतराणः
सम्यध्यूजापालनव्यापारप्रावहाःप्रजापतिरिप-लक्ष्मा
दावान्तवत्। नीत्याजनमनुरुथनुविदावनासोनोवेव
स्तःसर्वत्रापिसदाश्ववईतस्यकीर्तिर्नावस्तुतः॥
सन्तुयत्रियतांगुरर्वलत्तराद्रःकूर्म्मराजादमःसाध्या
नप्यतचीदुतेनमर्तताप्रत्यार्विपृथीभुजः। वक्रम्मकु
पितीयतागनिमिषाःपांसुःपुरापूरमात्यवंद्याहरतिप्र
माणपदाहायस्यखनद्भुदाना॥यस्मिन्स---गहावापिरि
वुलेःपूर्णैःपरित्यक्तकःप्राणस्यकथापिकानरतआ
नापनृपासदन्विाणेः॥प्राशाकल्पिरसत्फालतिविकाल
र्निश्चीयातपंश्चिमेर्म्मर्तुंकवलमुत्तरेनृपनिर्तिर्मध
याद्यास्यात॥प्रख्यातियस्मिन्प्रथमंदिशंहारक्रिहीर्घया
नन्यसमानदन्निनं॥यर्घाविशाक्रोडपातःप्रदरसूः

राशादूसहसापुरंदरः॥ नुत्साहाच्चतिसन्निमित्तकृनिताऊस
प्रत्याण—मणाक्रम्यदिपुरीराणेकरतिकाविवस्यविद्वषिगः
॥यनावास्यतविक्वानिर्सरमपुत्संचारचापूल्लसल्लालाद्यानलता
विनानवसातारादापकल्प—ल॥ज्ञातानऊन्यग्रसमाकुना
निवीजानियलुऊरमकूनानितटाचाला च्चाटनतत्पराआ
रिगप्रवाहाम्भिपरंपरायाः॥॥यद्यात्लालकनालनिर्सरकराः
कुम्भायमानाच्चंमकूटान्नाःकरकन्नित्तागविगलन्नयाय
मानामूत्तः॥प्रायात्तपिविसविसिनुरविआयद्वाहिनीवारणे
उन्मीलन्नादामदोर्च्चित्तिदिरविन्यस्यपादचलाः॥स्फार
लल्लारचारमूगितगुरुतरीनूरकुम्भकटङ्कशमापइवत्वुरा
गत्वरितहरिटगूढकचक्रम्यगणाः॥यनालरपन्नासना
करिकरटताटाहमटानागुहाच्चद्याविद्वागप्यचन्यद्विपकल
पटलद्यामलाविन्नापादाः॥॥यदिक्किन्नुरवन्द्वःकृयमः
ल्लालादिगवात्तवःक्रीडाक्राउकुदुमूकानिऊलगुक्मवह्न
चर्यहिषः॥यत्सनानृपगन्नसिपुरमुन्मेरीविहस्तीकृ
तेस्तेरथङ्गकलिङ्गकुञ्जरकुलेयुद्धायवाद्धाऊलिः॥॥र
वास्तापुरुषोत्तमःसत्तगवानाशिश्रियत्यःश्रिया त्य
नदंवलिंविरिनःदिशुनादिशंसमाश्वासितं॥यनाकारिव
सुन्दारनिटवतःसानन्दमुन्दाकृतांयस्यप्राच्यपाप्यानिकि

चुचञ्चानेत्थीऽस्तुनिःप्रसुत॥॥य कल्यानलवूगमलुलतिलां
ठकार—नीविद्विषःसंवल्लीलसितान्वकारसुहृदस्तघर-
द्वियद्दांन्वयाःवित्वा———लादपश्रयनुदपा—वगाहा
द्यतेर्यत्सामन्तमतङ्गजेरचरितास्तथ्यावनूर्म्मयः॥
कुन्तसम्भवासादार्यतापाद्यीमुपाश्रसि॥मीलाद्येन्द्रीव
किर्त्तयविच्चारादवदाये॥लीलामन्तःप्रवानयसीयपृतना
सामन्तरुसीगन्तिनीश्रापि———————एरसनीमु
क्ताःपतन्तिस्मयाःतान्तिःसंप्रतिपप्राघनुपृथिवीयत्तां
मपल्लीपयःपथ्याद्यापितादवपाद्यनृपास—वानवेजाय
त॥स्वामिर्द्धप्रसासत्तरत्नयातासमस्याम्मारुतिप्रा।
याप्राहुतशीलगृद्धरविताहृदिप्रूति——य———
दृत्यनुत्तहालमकथितंतङ्गरवङ्गाजयःसिनाहास्ति
कासतुनेवविदावद्दीपान्तारापक्रमं॥न्नघावत्तकूपसज
घायमाशांजस्यञ्जिघसर्ष्षतिस——द्वामत्तत्वकीर्यांक
नुत्तंचजपाज्याद्वापाञ्जिवुंपाशात्तदघपराः॥—गनाल
प्रमुखावसन्निकुहविकालब्धिरोस्तकचित्सन्निकापि
तिमिंगिलप्रत्तजःकुत्सपिशातहरिः। पतद्हस्तिनाका
पियत्तङ्गलक्षितस्याथपार्थपयःपीत्वा मक्करिन्तिःकृतिक
स्तिस्तिरगस्यायितं॥ये:सन्तूयतिभिङ्गिलप्रत्तिन्तिः

संसर्ण्णिरुत्तचातापाताकनसवन्नुतांशिखरिणामिना
कमुख्याअपि।लाभ्यन्मन्दरडम्बराणिदिविरातेरथा
षम्बुविन्यासनागऊराऊ—।—रकराप्———ना
—रवलेः॥प्रक्षेतितिङ्कारिवराहराऊमर्त्यलदाशांप
तिरस्यस्यानुः।दिक्कपित्तीत्कस्तितवित्तपाशित्तूपेःप्र
तीपेर्विन्नाजेर्वत्तूव॥आरामाःसयरायरावपितदापु
न्नागपूगादिमदुल्मान्तर्वनादवताभिवऊयश्रीमय
शःपादपाःअस्यासन्नऊदण्डचण्डमलसाल्लालासिल
क्षीकृताकृाणीपालऊरुपालगण्डलगलत्कीलालकु
ल्याकुलाः॥एवालात्वातुरुष्कदत्तविलसद्धावलीवल्लेनेक्षाम्यलुरुमाकसराविकमृदोवंकूप
कण्डखाल।यनावास्यसरस्वतीसविवतासाविक्षावान्धा
टवश्चादूनुत्कदर्पदिपकुरमतःकीराविपाद्याप्यत्
॥तनयापुरमण्डलेसुकृतिनायास्मेग्राहभ्रूभ्रहृ
यहृमहृयमग्रियणविविनाविश्राणितंश्रद्यात
द्रात्यनरवर्म्मादवत्पतिःपथ्यपरीक्षर्त्तृतद्धामंमा
खलपारकास्यमंदिशादशतयास्यचुम्बा॥ॐ॥तत
स्वयंकृतानेकप्रशस्तिस्तुतिचिन्तितं।श्रीमल्लक्ष्मी
धरणेनतद्वागारमकार्यत॥सं ११९१॥



Transcript of the Inscription in Balbodh.

दधन्भोत्तारत्वै ॥ प्रसादौदार्यमाधुर्य्यसमाधिसमतादयः ॥ युवयोर्ये गुणाः संतिवाग्देव्यौतेपिसंतुनः ॥ एकएवभुवनत्रयेपिसश्रीपतिर्भवतुवोवि भूतये । य(स्यचा)व्ययपदश्रितोप्यमीभास्करप्रभृतयश्चकासति ॥ जाति वृत्त (त्तै)श्च(सहितागु) णालंकारवारदः(वारिदाः) । सरसाश्चप्रसीदंतुसू क्तयः सूरयश्चनः ॥ दुर्धरारिपुरभद्रभीषणोभूरिभूतिम(स) विशे (षभूषणः (रा) जराजकृतसक्रियः क्रियाद्वन्हिवंशसदृशःशिवःशिवं ॥ जातामहा र्ण्णवोत्पन्नेब्रह्मांडशुक्तिसंपुटे । महेश (संम) तामुक्ताजयंत्यंभोजयोनयः ॥ वैराग्यंचसरागतांचनृशिरोमालांचमाल्यानिचव्याघ्रानेकपचर्म्मणीचवसने चाहींश्चहारादिच । यद्भूतिंचविलेपनंचभजतेभीमंचभव्यंचतद्दिश्याद्रूपमु मारमारमणयोर्भुक्तिंचमुक्तिंचवः ॥ वैश्वरथ्यासमः (क) म्म (र्म) मीमाज्ञानृ (मांसाभृ)तिकैतवात्स्वाभिन्ननिर्मिताशेषविश्वोविष्णुःपुनातुवः॥अग्निः(म) ग्रस्तगिरीन्द्रगर्वगरिमानीलाश्मसानूल्लसत्कान्तिव्रातविडम्बितांबरतलः श्रीमान्मगेन्द्रोब्बुदः । यस्यव्योमतलोद्दिलङ्घिशिखरप्राग्भारपद्माकरप्रे ङ्खत्पद्मपरागचक्रळि (मि) तरब्रह्माण्डखण्डायते ॥ देवैरावृतमभ्रमण्डल मिदम्मर्त्यैश्चभूमण्डलंकृत्वाव (ध) र्म्मतुलायमानवपुषोयस्यान्तयोर्न्यस्यच ॥ जानेयावदवैतुमिच्छतिविधिःकिंशुद्धमित्येतयोरूर्ध्वंतावदगादमर्त्यशिखरि स्तस्मान्नभोमण्डलं ॥ लेभेविभिद्यजलविप्रधिभूमिचक्रमाकाशचक्रमपियेन दिगन्तनेमि।संसारवर्त्मनिमहाविषमेनिषन्न(ण्ण)भाग्राप्तैकतटविश्वरथांत (ग)लक्ष्मीः ॥तस्मिन्वेदविदांवरः सभगवानाकाशगङ्गापयःपूरप्लावित कान्तकोमलतटेतिष्ठद्वसिष्ठोगुनिः।यस्तेवा (स्त्रेता) नलधूमवर्तियमुनांप्रीत्यै पितुः (सु) व्रतोगङ्गासङ्गमसिद्धयेसमनयद्ब्रह्माण्डखण्डंप्रति ॥विद्याम हासरिदुपान्तविवर्त्तिघोरसंसारसैकतविषन्ण(ण्ण)मशक्तमेते । यस्यत्रिलो करथमुत्पथसंप्रवृत्तमुत्तारयंतिशतशोप्युपदेशतायाः आयातस्यकदाचनक्षि तिपतेराच्छिन्दतः कौशिकस्यातिथ्योचितवस्तुजातजननादानन्दिनींन न्दिनीं । निर्ज्जेताकुपितेनतेनहविषासंहर्षिताद्बर्हिषोवीरःश्रीपरमारइत्य

नुपमः सत्याभिधानोभवत् ॥ राघवादृतविशालवर्म्मभृत्सत्यकेतुपृथुकीर्त्तिपार्थिवः । वर्धतेयमहिमांशुचद्रमः संततिप्रतिकृतिर्यदन्वयः ॥ वराजरामराजितोनलोद्भूवःसभारतः । ग्रहेन्द्रचन्तूयोरिवव्यजायतायमन्वयः ॥ ठ ॥ वंशेस्मिन्वीरसिंहः क्षितिपतिरभवद्भूरिभूतिप्रभावसाम्राज्यौदार्य शौर्यप्रचयपरिचयप्राज्यसौराज्यसिद्धिः। नम्रक्ष्मापालभालस्थलदलितलुलत्कांतकोटीरकोटित्रुट्यन्माणिक्यचक्रस्फुटितमणितत्पादपीठोपकंठः। सर्वाशाविजयप्रयाणसमयेयस्येन्द्रनीलप्रभैर्मायूरातपवारणैः शुशुभिरेनष्टावकाशादिशः । सर्पन्मत्तकरीन्द्रचक्रचरणप्रभारदीर्णस्थिरारम्भोद्भूतविपन्नशेषसविषश्वासावरुद्धाइव ॥ पातालेवडवामुखानलमिषात्पृथ्वीतलेचस्फुरत्सौवर्णाचलकैतवादियतिचव्रह्माण्डखण्डच्छलात्। चञ्चत्काञ्चनचक्रवालवलयव्याजाच्चदिङ्मण्डलेयस्याद्यापिसमुल्लसत्यविचलीभूतःप्रतापानलः॥ स्वर्लोकेषुचविद्विषत्क्षितिषुचव्यालेन्द्रगेहेषुचस्वाराजंचरिपुप्रजंचपुरजिन्नागाधिराजंचयः । ऐश्वर्य्येणचविक्रमेणचधराभारक्षमत्वेनचन्यक्कुर्वंश्यपराभवंश्यसमतिक्रामंश्चपृथ्वीमधात् ॥ ✕ ॥ तस्माद्वैरिनृपावभेदनवधूवैधव्यदुःखोद्भवद्बाष्पाम्भः कणशांतकोपदहनः श्रीभीमकोभून्नृपः। आविर्भावितनूतनस्थितिरयंब्रह्माण्डखण्डच्छलाद्यस्याद्यापिविलोक्यतेवियदधोधूमः प्रतापानलः॥ अनुगगनमुदस्थः(स्ताः)स्थूलमुक्तोच्छ्रायेयदसितदलितनुष्टा(दूष्या) कुम्भिकुम्भस्थलेभ्यः ॥ सततमपिपतन्तस्तेद्वयावन्त्रपृथ्वींपृथुलतरलताराज्याजभाजोभजन्ते ॥ अत्याश्चर्यमदृष्टमश्रुतमिदंकस्मिन्समाचक्ष्महेकोन्वेतत्प्रतिपद्यतेचतदपिप्रस्तूयतेकौतुकात् । उत्पत्त्यापिवसुंधरामसदृशींलब्ध्वापिलक्ष्मींचयः कुर्वन्कार्यमनेकशः सुमनसामागान्नवैकुण्ठतां॥ ✕ ॥तस्माद्वैरिवरूथिनीवदधिपप्रारब्धलुप्यत्पुरप्रध्वंससैकपिनाकपाणिरजनिश्रीरा (भो)जराजोनृपः । प्रायःप्रावृतवान्पिपालयिषयायस्यप्रातापानलोलोकालोकमहामहीध्रवलयव्याजान्महीमण्डलं ॥यस्मिन्सर्पतिलीलयापिललितैः सैन्यैः समुद्भ्रामितंवाहव्यूहविसारिधूलिपटलव्याजादिङ्मण्डलैः।अत्युद्भ्रान्तकरीन्द्रवृन्दपघटाप्रेङ्खालनोच्छृंखलप्रेङ्खच्छृंखलनादनिर्भरभृतब्रह्माण्डभा

ण्डोद्भटैः। यन्निस्त्रिंशनिरस्तमस्तकतयालब्ध्वान्यथादुर्लभंदेवत्वंस्वकबन्धमु-
द्वृतमधोदृष्ट्वाभटैर्वेष्टितं॥संहर्षात्पततोविमानशिखरादाश्लिष्यकंठेहठाद्वि
रान्वेषणरागिणोरुरुधिरेसंभूयसिद्धाङ्गनाः ॥ ✕ ॥ तस्यासीदथपार्थिवः पृ
थुयशाः श्रीभद्रराजोनुजः स्फूर्ज्जद्वाडवपावकस्फुटमहः सोदर्य्यशौर्य्यानलः।
यसंग्रामयुगान्तवल्गितभुजादुर्व्वातदूरोल्लसत्कलोलायितमंडलाग्रपटलेना
मर्दयद्भूभृतः॥व्रजतिजयिनियत्रामित्रजातेनजज्ञेतरलतुरगवेगोद्भूतभूरेणु
राजिः ॥ विकटकरटिभारभ्रष्टभूपृष्ठरन्ध्रादुदितइवसमन्तादन्तकालाग्निधू
मः ॥ गाम्भीर्यंप्रलयार्ण्णवस्यचबलंकल्पांतवातस्यचस्थेमानंकमठेशितुःप्रचु
रताब्रह्माण्डभाण्डस्यच ॥ तेजःकालहुताशनस्यचमहीयस्त्वंद्युचक्रस्यच
स्वीकृत्येवविनिर्म्मितंयमविदुःप्रत्याजिपृथ्वीभुजः ॥ ✕ ॥ तत्सूनुर्भुवनैकभूषण
मभूद्भूपालचूडामणिच्छायाडम्बरचुम्बितांघ्रिकमलः श्रीभोजदेवोनृपः। य
स्याध्यासनमाश्रयन्तिचरणौराज्यासनोद्वासिनः स्पर्द्धाबन्धविनम्रनिर्झरनट
त्कोटीरकोटित्विषः।रटत्पटहपाटवप्रकटकुञ्जरस्फूर्जितस्फुरद्भ्रमरडम्ब
रोडुमरडिण्डिमोड्डामरा।स्फुटत्करटकुञ्जरप्रपदसंपतत्संयमभ्रमद्भुवनभू
तलप्रगटयमरूचकैः॥ वैकुण्ठः कमलासनायचतुरास्यायस्वयंभूःपुनःपञ्चा
स्यायहरायशम्भुरपिषड्वक्त्रायपुत्रायच। सेनानीरपिदन्दशूकपतयेजखंस
हस्राननायाद्यापिस्पृहयत्यमर्त्यसमितौयत्कीर्त्तिमुत्कीर्तयन्॥ ✕ ॥तस्मिन्वास
ववन्धुतामुपगतेराज्येचकल्याकुलेभग्नस्वामिनितस्यसूनुरुदयादित्योभवद्भूप
तिः। यनोद्धृत्यमहार्ण्णवोपमगिलत्कर्ण्णाटकर्णप्रभुमुर्व्वीपालकदर्थितांभुवमि
मांश्रीमद्वराहायितं ॥ यस्मादुद्यतरप्रतापनिचयादारूढदुर्दर्शनाद्दूरेभास्क
रविभ्रमादभिमुखैःप्रापंचियैः पूत्रचता। मन्येसोयमितिप्रतीतिविततामर्षप्रक
र्षेणतेभित्वाभास्करमण्डलंरिपुचयाः प्रापुः परांनिर्वृतिं ॥एकस्यांभ्र(स)मि
तौविलोक्यविजयंयस्यापरस्यांस्तुव वक्र(कृ)तांसमर्थयतिदृग्भिद्ग्रीहासत
स्यद्वये। किंचानन्दनिमीलितेक्षणतयाश्रौतैःसुखैर्वंचितश्चक्षुःकर्ण्णमकर्ण्णम
प्यहिपतिःस्वीयंवपुर्नैंदति॥ ✕ ॥पुत्रस्तस्यजगत्त्रयैकतरणेःसम्यक्प्रजापा
लनव्यापारप्रवहाःप्रजापतिरिवश्रीलक्ष्मदेवोभवत्।नीत्यायेनमनुस्तथानुविद

धेनासौनवैवस्वतः सर्व्वत्रापिसदाप्यवर्द्धतयथाकीर्त्तिर्न्नवैवस्वतः ॥ सभूयश्रिय तांगुरोर्बलभराद्भोःकूर्मराजादयः सद्योनश्यतविद्युतंनमतरेप्रत्यर्थिपृथ्वीभुजः। चक्षुर्म्मंक्षुपिधीयतामनिमिषाः पांसुःपुरापूरयत्येवंव्याहरतिप्रयाणपट होयस्यस्वनछद्मना ॥ यस्मिन्सर्पतिबान्धवोपिविधूरैः पूर्वैः परित्यजतेक (का) प्राणस्यकथापिकातरतयानापेक्ष्यसे(ते) दक्षिणैः। आशावल्लिरसत्फ लेतिविकलैर्निश्चीयतेपश्चिमैर्मर्तुंकेवलमुत्तरै र्नृपतिभिर्द्वेषाप्ययोध्यास्थते ॥ प्र यातियस्मिन्प्रथमंदिशंहरोर्जिहीर्षयानन्यसमानदन्ति नां॥ ययाविशद्गौडपतेः पुरंदरस्तथासुरैः स्वः सहसापुरंदरः ॥ उत्साहोन्नतिसन्निमित्तजनिताजस्र प्रयाणक्रमेणाक्रम्यत्रिपुरींरणैकरतिकान्विध्वस्यविद्वेषिणः ॥ येनावास्यतवि श्वनिर्झरमरुत्संचारचारूलसल्लीलोद्यानलताविताननवसतौगोदोपकण्ठंकि ल ॥ जातानिजन्यभ्वघमार्ज्जनादिबीजानियत्कुंजरमज्जनानि । तटाचल स्फाटनतत्परायारिंगप्रवाहोर्म्मिपरंपरायाः ॥ येव्यालोलकरालनिर्झरकराः कुंभायमानोन्नमत्कूटांताः कटकांतभागविगलद्दानायमानांबुदाः । प्राय स्तेपिविरोधिसिन्धुरधियायद्वाहिनीवरणैरुन्मीलन्मदमेदुरैर्विभिदिरेविंध्यस्य पादाचलाः ॥ स्फारत्कलारवारिस्थगितगुरुतटीकूटकुट्टाकटङ्कप्रायप्रे खत्खुराग्रलरितहरिचमूचक्रचन्क्रम्यमाणाः।येनालंध्यंतसेनाकरिकरटतटो द्दामदानांबुगन्धव्याविद्धागण्यवन्यद्विपकुलपटलव्याकुलाविन्ध्यपादाः ॥ये दिक्सिंधुरबंधवःक्षयमरुल्लोलादिगिभ्याभृतक्रीडाक्रोडकुटुम्बकानिजलमु क्सब्रह्मचर्याजुषः। यत्सेनानृपगंधसिंधुरमरुन्मैत्रीविहस्तीकृतैस्तैरप्यंगक लिंगकुंजरकुलैर्युद्धायबध्नोजलिः ॥ देवास्तो (वोसौ) पुरुषोत्तमः सभगवा नाशिश्रियेयः श्रियायेनेदंबलिवैरितः समवनाद्विश्वंसमाश्वासितं । येनाधारि वसुंधरेतिदव (र) तः तानंदमंदाकृतायस्यप्राप्यपयोनिधौबुधजनैर्व्याजस्तु तिः प्रस्तुता । येकल्पानलधूममंडललिखत्कादंबिनीविद्विषः संवर्तोल्लसिता न्धकारसुत्ददस्तुद्यद्विद्यदबांधवाः ॥ विभ्राजच्छकुलादयश्रमनुदेपाथोवगा होद्यतैर्यत्सामन्तमतंगजैरधरितास्तेप्यम्बुधेर्म्मयः ॥ कुंभसंभवसोदर्येयत्रा पाधिमुपाश्रिते । शीलायौनींचकेस्तैयोविंध्यबांधववाडवे ॥ लीलांभः प्रवणे

°यदीयपृतनासामंतसीमंतिनीश्रोणिश्रेणिगलत्सुवर्णरसनामुक्ता : पतंतिस्म. याः । ताभिः संप्रतिपप्रथेनुपृथिवींयत्ताम्रपर्णीपयः पश्याद्यापितदेवपाण्ड् यनृपतेर्जीवातवेजायते ॥ स्वामिन्नेषससेतुरत्रभवतोरामस्ययोमारुतिप्रायोपा हृतशैलगव्हरचितोप्यब्धिप्लुतेरिच्छया॥येनागत्यकुतूहलेनकथितंतज्ज्ञैर वज्ञायय: सेनाहास्तिकसेतुनैवविदधेद्वीपांतरोपक्रमम् ॥ त्रिधाविभक्तेनयथा यमाशांयस्याग्रिमेसर्पतिसैन्यशब्दे । अभूत्स्वकीयांककुभंव्यपायाद्रोपायितुं पाशभृदप्यपाशः ॥मैनाकप्रमुखावसंतिकतिचित्कालाग्रिरात्तेक्वचित्सान्ति क्वापितिमिंगिलप्रभृतयः कुत्रापिशेतेहरिः । यत्तद्वेत्तिनकोपियत्रजलधौत् स्याप्यशब्दंपयः पीत्वायत्करिभिः कृतैकचुलुकैस्तैस्तैरगस्त्यायितम् ॥ यैस्सं भूयतिमिंगिलप्रभृतिभिः संसर्पिणस्तन्वतेपोताधानसबन्धुतांशिखरिणोमैना कमुख्याअपि । भ्राम्यन्मन्दरडम्बराणिदधिरेतैरप्यशेषैर्बुधैयत्सेनागजराज सारकरभैर्मुक्ताविताने।ज्वलैः ॥ यक्षातितिक्षोरिवराजराजमन्यांतदाशां प्रतियस्ययातुः।द्विधापिभीत्युज्झितवित्तपाशैर्भूपैःप्रतीपैर्विभयैर्बभूवे ॥ आरा माःसधराधराअपितदापुत्रागपूगादिमद्गुल्मांतर्व्वनदेवताइवजयश्रीमद्यशः पादपाः ॥यस्यासन्भुजदंडचण्डिमलसल्लोलासिलक्ष्मीभृतःक्षोणीपालजभा लमंडलगलत्कीलालकुल्याकुलाः । खेलोत्खाततुरुष्कदत्तविलसद्बाहावली वेलनेक्षाम्यत्कुंकुमकेसराधिकमृदोवंकूपकण्ठस्थले । येनावास्यसरस्वती सविधतासाहित्यवाक्पाटवस्वादूनुत्कटपत्रिपंजरगतः कीराधिपोध्याप्यते ॥ तेनव्यापुरमण्डलेसुकृतिनायस्मैग्रहेंद्रग्रहेयद्ग्रामद्वयमग्रियेणविधिनाविश्रा णितंश्रद्धया । तद्भ्रातानरवर्मदेवनृपतिः पश्यन्परीवर्त्यतद्ग्राममंमोखलपाट लाख्यमदिशद्दशेभयेस्येछया ॥ ✕ ॥तेनस्वयंकृतानेकप्रशस्तिस्तुतिचित्रितं श्रीमल्लक्ष्मीधरेणैतद्देवागारमकार्यत ॥ सं ११६१.

हंहोबुधाः साधुसमुत्सहध्वंकुशाग्रकल्यांचधियंविदध्वं । मध्यस्थभावंच समाश्रयध्वंसुखंचनःसूक्तिसुधांगणध्वं ॥ वंदनीयावुभौस्तोमेश्रोतारौतौविप- श्चितौ ॥ यावश्रुमुंचतः सांद्रमानंदालस्यनिर्भरौ ॥.

ART. II.—*Result of a Comparison of the Observations of nine different Barometers, read every half hour, for 24 successive hours.* By GEO. BUIST, L.L. D. in charge of Bombay Observatory.

The present paper was laid before the Society in an enlarged form, at the ordinary monthly meeting on the 9th July. It was originally meant to illustrate a Chart $3\frac{1}{2}$ by $2\frac{1}{2}$ feet in size, on which the Barometric curves deduced from the figure tables now alone given were projected. The portion of the paper specially alluding to these has been omitted as unintelligible without the chart, whose magnitude rendered it inadmissible, and which was not capable of being reduced to such dimensions as to permit of its being included in this journal.

An error in the standard Barometer which was then alluded to, having been detected by means of the combined observations, has now been corrected by the addition of 00.125 to the reading of the instrument. This very nearly corresponds with the interval which exists on the diagram, as well as in the readings noted on the figure tables printed along with it, betwixt the readings of the standard and the mean of all the readings of the other instruments. The standard Barometer is a large one by Newman, (No. 58) the same as all the magnetic observatories are supplied with, with a tube of 530 diameter, requiring a correction of + 0.003 for capillarity. The scale is moveable, so that the correction for the rise of the mercury in the cistern is effected by bringing in contact with its surface the point of the rod to which the scale is attached. The barometer marked No. 8, is by Gilbert, and is the same in point of construction as those formerly supplied from the Government stores—the scale being of brass, the frame of wood. The Royal Society have stated, that no exact correction can be given for expansion in instruments of this form, which "no scientific observer would ever willingly use."* No account has been taken of it in the following remarks. The Barometers from No. 1 to No. 6 are uniform in point of construction. They were manufactured and

* Report of the Committee on Physics and Meteorology, &c. 1840. Though this instrument has been noted in the table, no account has been taken of it in the subsequent speculations.

brought to Bombay in 1843; the experiment under review having been made just after their arrival. No. 7, is by the same maker, and is of the same form nearly: it was brought to India early in 1840, and has since been occasionally employed in the Deccan as a mountain Barometer.

These instruments are all very beautiful in point of workmanship. They are fitted up with a brass frame, in which the attached Thermometer is sunk. The cisterns are of cast iron, with a glass plunger which can be screwed up so as to move the mercury to the top of the tube. The neutral point is marked on a short glass tube, enclosed in a cast iron sheath, ascending from the top of the cistern. The mercury is on each observation screwed up to this, which at once gives the correction for rise in the cistern and for capillarity. No correction for temperature has been made. The instruments were in this respect subject to nearly the same fluctuations of heat; the entire difference betwixt the attached Thermometers in no case amounting to two degrees Fahrenheit: this is equivalent to a difference in the Barometer of 0.005. If this be added, some of the minor discrepancies will altogether disappear.

The instruments were numbered arbitrarily, for the sake of distinction only, just before commencing observations. The mean of 48 readings of No. 4, is 29.699; that of No. 7, 29.743; the difference between them is 044. These are considerably the lowest and highest. Nos. 5 and 6 are perfectly coincident, and Nos. 1, 2, and 3, only differ .004 and .006 from each other respectively. The greatest of these very little exceeds the differences given betwixt some of the mountain Barometers provided for the Antarctic Expedition by the Royal Society's Standard; the least of them are less then the disagreements betwixt the crown glass and flint glass Barometers of Somerset House.

The Sympiesometer which is noted in the table, is not here taken account of. It is a good instrument, by Adie, and has been in my possession since June 1840.

The following tables give the readings uncorrected. The standard is 36 feet above the mean level of the Sea; the other instruments 33 feet; there being no means of placing them exactly beside each other.

Observed Readings of Eight Barometers (half-hourly,) from 4. a. m. 20th June to 3½ p. m.

Bombay Mean Time.		Standard.		No. 1.		No. 2.		No. 3.		No. 4.		No. 5.		No. 6.		No. 7.		No. 8.		Sympiesomr.	
		Barom.	The.	Barom.	The.	Barom.	The.	Barom.	The	Barom.	The.	Barom.	The.	Barom.	The.	Barom.	The.	Barom.	The.	Symp.	The.
A.	M.		dega		degs.		degs.		degs.		degs		degs.		degs.		degs.		degs		degs.
4	0	29.705	83.5	29.694	82.0	29.698	81.8	29.698	81.8	29.650	81.7	29.700	81.7	29.700	81.6	29.730	81.8	25.684	81.5	29.24	82.5
4	30	.715	83.2	.712	81.7	.720	81.5	.714	81.6	.686	81.5	.719	81.5	.816	81.5	.728	81.6	.690	81.3	.26	82.3
5	0	.715	83.1	.720	81.5	.720	81.5	.720	81.5	.680	81.5	.720	81.6	.716	81.5	.710	81.5	.712	81.1	.26	82.0
5	30	.725	82.8	.742	81.2	.760	81.0	.760	81.2	.736	81.2	.760	81.2	.760	81.2	.736	81.2	.720	81.0	.28	81.6
6	0	.729	82.4	.748	81.1	.762	80.0	.768	81.1	.746	81.1	.768	81.0	.772	81.0	.750	81.0	.732	81.0	.35	81.7
6	30	.751	83.3	.752	81.2	.768	81.2	.774	81.0	.750	81.0	.774	81.2	.780	81.2	.782	81.2	.742	81.0	.30	81.8
7	0	.755	82.2	.762	81.8	.770	81.9	.776	81.8	.754	81.9	.776	81.9	.784	82.0	.794	82.0	.746	81.8	.31	22.0
7	30	.757	82.7	.768	82.5	.778	82.5	.780	82.5	.760	82.4	.780	82.4	.790	82.5	.790	82.2	.750	82.1	.30	82.6
8	0	.759	83.2	.774	82.6	.780	82.7	.784	82.7	.766	82.7	.784	82.6	.794	82.7	.792	82.7	.758	82.8	.28	82.9
8	30	.765	83.7	.778	82.8	.784	82.9	.790	82.8	.770	82.8	.790	82.8	.798	82.8	.799	83.0	.770	83.0	.28	83.5
9	0	.771	84.6	.782	84.0	.780	84.0	.792	84.5	.774	84.2	.792	84.3	.799	84.4	.800	84.7	.774	84.9	.28	84.6
9	30	.757	85.2	.760	85.2	.770	84.8	.760	84.2	.756	84.9	.774	84.8	.776	84.8	.780	84.9	.760	85.0	.24	85.0
10	0	.747	85.7	.740	84.9	.744	84.8	.742	84.8	.709	84.7	.756	84.7	.750	84.8	.760	84.7	.750	85.4	.22	85.1
10	30	.745	86.0	.728	84.8	.739	84.5	.739	84.5	.700	84.5	.748	84.5	.744	85.0	.758	85.0	.746	85.3	.20	84.1
11	0	.735	86.2	.728	85.5	.736	85.3	.728	85.5	.690	85.4	.734	85.4	.736	85.6	.746	85.6	.740	86.0	.17	85.5
11	30	.735	86.6	.728	85.0	.738	84.8	.728	85.0	.698	84.8	.736	84.8	.736	85.2	.740	85.4	.737	86.0	.17	35.7
P.	M.																				
0	0	.727	86.5	.719	85.5	.725	85.0	.730	85.0	.680	85.2	.730	85.2	.729	85.7	.738	85.7	.730	86.2	.16	85.7
12	30	.712	87.0	.702	86.1	.705	85.8	.711	85.8	.665	86.0	.712	86.0	.711	86.3	.728	86.3	.719	86.8	.18	86.3
1	0	.699	87.3	.692	86.5	.700	86.3	.700	86.3	.688	86.3	.700	83.8	.700	86.5	.712	86.5	.718	87.0	.11	86.7
1	30	700	87.6	.690	86.5	.700	86.3	.700	86.5	.668	86.3	.700	86.3	.700	86.5	.710	86.5	.706	87.1	.10	86.9
2	0	.695	87.8	.686	85.8	.691	85.7	.695	85.8	.678	85.6	.696	85.5	.694	85.9	.703	86.0	.722	86.5	.10	86 5
2	30	.685	87.5	.673	85.5	.678	85.3	.684	85.3	.671	85.2	.680	85.2	.681	85.5	.691	85.5	.690	86.2	.11	86.2
3	0	.686	87.2	.672	85.5	.680	85.3	.684	85.6	.673	85.2	.688	85.3	.684	85.5	.698	85.5	.692	86.2	.11	86.0
3	30	.677	87.2	.664	85.4	.670	85.1	.670	85.2	.656	85.1	.680	85.2	.676	85.5	.690	85.5	.688	86.0	.11	86.0

The table continued from 4 P. M, at 20, to 4 A. M. 21 June.

Observed Readings of Eight Barometers (table continued) from 4 p. m. 20th June to 4 a. m. 21st June, 1843.

Bombay Mean Time.		Standard.		No. 1.		No. 2.		No. 3.		No. 4.		No. 5.		No. 6.		No. 7.		No. 8.		Sympiesomr.	
		Barom.	The.	Barom.	The.	Barom.	The.	Barom	The.	Barom	The.	Barom.	The.	Barom.	The.	Barom.	The.	Barom.	The.	Symp.	The.
P.	M.		degs.		degs.		degs.		degs.		degs.		degs.		degs.		degs.		degs.		degs.
4	0	29.671	87.1	29.658	83.1	29.660	85.0	29.669	85.0	29.656	84.8	29.670	85.9	29.670	85.3	29.620	85.1	29.680	85.9	29.11	85.6
4	30	.667	86.8	.650	84.9	.654	84.8	.660	84.8	.642	84.7	.662	84.8	.658	84.8	.672	84.9	.674	85.0	.13	85.4
5	0	.673	86.6	.656	84.5	.660	84.6	.662	84.5	.650	84.2	.664	84.3	.662	84.4	.678	84.5	.680	84.6	.14	84.6
5	30	.669	85.8	.652	84.1	.660	84.2	.654	84.1	.654	83.9	.660	84.0	.658	84.0	.670	83.9	.672	84.0	.12	84.1
6	0	.669	85.2	.650	83.7	.658	83.6	.650	83.5	.658	83.7	.660	83.6	.660	83.7	.672	83.6	.672	83.7	.12	84.3
6	30	.683	85.0	.656	83.5	.662	83.5	.668	83.4	.668	83.4	.672	83.5	.672	83.5	.690	83.4	.686	83.5	.14	84.2
7	0	.695	84.9	.690	83.4	.692	83.4	.690	83.4	.686	83.3	.698	83.4	.700	83.5	.712	83.4	.708	83.4	.16	84.2
7	30	.699	84.4	.706	83.4	.704	83.4	.700	83.3	.710	83.3	.714	83.4	.716	83.3	.730	83.3	.720	83.4	.18	84.1
8	0	.703	84.2	.712	83.0	.698	82.9	.694	83.0	.708	83.0	.698	83.0	.724	83.3	.728	83.5	.704	83.8	.20	83.8
8	30	.708	84.0	.700	82.3	.700	82.4	.700	82.5	.692	82.5	.710	82.5	.710	83.3	.717	82.5	.706	82.9	.22	83.5
9	0	.715	83.2	.709	81.9	.706	81.9	.718	81.9	.700	82.0	.728	82.5	.720	83.7	.732	81.9	.704	82.9	.24	82.7
9	30	.738	83.0	.728	81.5	.720	81.5	.730	81.5	.718	81.7	.744	81 7	.736	82.9	.750	81.5	.736	82.6	.27	82.3
10	0	.737	83.0	.732	81.8	.730	81.5	.740	81.5	.721	81.8	.742	82.0	.744	82.0	.764	81.5	.736	81.8	.29	82.2
10	30	.726	82.7	.720	81.6	.723	81.5	.726	81.6	.722	82.2	.740	82.5	.732	82.3	.754	81.5	.730	81.9	.26	82.2
11	0	.727	82.7	.722	81.2	.726	81.4	.728	81.5	.726	82.4	.742	82.5	.736	82.8	770	81.9	.738	81.8	.26	82.4
11	30	.726	82.8	.730	81.6	.736	81.8	.736	81.9	.736	82.4	.746	82.4	.740	82.7	.776	82.0	.742	82.0	.27	82.7
A.	M.																				
0	0	.718	83.0	.724	82.4	.724	82.3	.722	82.3	.726	82.5	.728	82.7	.726	82.8	.760	82.5	.732	82.4	.24	83.2
12	30	.701	83.0	.700	82.4	.710	82.4	.700	82.4	.700	82.6	.712	82.6	.704	82.7	.740	82.5	.722	82.2	.23	83.4
1	0	.685	83.1	.690	82.2	.688	82.2	.690	82.2	.696	82.4	.686	82.4	.684	82.5	.700	82.2	.700	82.1	.20	83.0
1	30	.655	83.0	.670	82.5	.660	82.4	.675	82.4	.668	82.5	.680	82.6	.680	82.5	.700	82.3	.690	82.1	.20	83.0
2	0	.687	83.0	.678	82.0	.667	82.0	.670	82.2	.658	82.5	.688	82.5	.689	82.5	.698	82.5	.683	82.2	.20	82.7
2	30	.680	83.0	.670	82.0	.672	82.0	.672	82.0	.658	82.3	.682	82.3	.670	82.3	.690	82.9	.688	82.0	.20	82.7
3	0	.673	82.9	.664	82.0	.668	81.9	.672	82.2	.660	82 3	.680	82.2	.670	82.2	.686	81.9	.680	82.0	.20	82.4
3	30	.675	82.7	.660	81.5	.660	81.5	.668	81.5	.669	82.0	.680	82.0	.676	82.0	.700	81.6	.680	81.8	.21	82.2
4	0	.675	82.8	.676	81.8	.676	81.5	.674	81.6	.660	81.9	.678	81.7	.674	81.9	.702	81.5	.682	82.8	.22	82.1
Means.		29.711	84.5	29.706	83.3	29.710	83.2	29.712	83.2	29.699	83.3	29.718	83.4	29.718	83.5	29.743	83.1				

Dismissing No. 7, whose sluggish movements render it liable to suspicion, the mean height of the whole of the others may be assumed as nearly the proper elevation of the mercury for the day; this was 29.710.

In comparing the altitudes of the Barometers at 4 o'clock on the morning of the 20th, which may be assumed as the minimum, or nearly so,—No. 7, continuing to descend till 5, with the maximum obtained by all the Instruments, save No. 2, exactly at 9 oclock, we shall have the following result. In reality the comparison ought to have been with the maximum of 10 P. M. of the 19th, but of this we have no readings.

	A. M.	1	2	3	4	5	6	7
Maximum diff. 054	9 A. M. . . .	29.780	29 780.	29.792	29 774.	29.792.	29.799.	29.800
Mean range 097	4	.694	.698	.698	.650	.700	.700	.730
Interval 5 hours	. . . diff. . .	.088	.082	.094	.124	.092	.099	.070

The following is the difference betwixt the same hour of maximum and the afternoon minimum of the 20th, which follows at 5 P. M., at an interval of 8 hours.

	A. M.	1	2	3	4	5	6	7
Maximum diff. 635	9.	29.780	29.780	29.792	29.774	29.792	29.799	29.800
Mean range 122	5 P. M.	.656	.660	.662	.650	.664	.662	.678
	. . diff. . . .	.124	.120	.130	.124	.128	.137	.102

The following is the range betwixt half past 11, P. M. on the 20th and half past 3 A. M. on the 21st.

P. M.	1	2	3	4	5	6	7
11½	29.730	29.736	29 736	29.736	29.746	29.740	29.776
. . . . .	.660	.660	.668	.669	.680	.676	.700
A. M. 3½							
. . . . .	.070	.076	.068	.076	.066	.064	.076

Maximum diff. 010=mean range 71.

But on this occasion the Instruments attained the maximum and minimum irregularly, in point of time for example:

1	2	3	4	5	6	7
10 P M.	11½	10	11½	11½	11½	11½
732	736	740	736	746	740	776
660	660	668	660	678	674	700
½ p. 3	½ p. 3	½ p. 3	½ p. 3	4.	4.	½ p. 3
.072	.076	.078	.076	.068	.066	.076

Maximum diff .010=Mean range 070.

Five Instruments attained their maximum at ½ part 11, and two at 10 o'clock,—they had all fallen during a shower at ½ past 10; and though they all rose again, No 1 & 3 did not attain the altitude they had reached

at the earlier hour; so, in like manner, the morning minimum was disturbed by a shower a little before two, and again before four, which deranged the hour of minimum of No. 5 and 6, whose lowest point was at 4 o'clock. With the correction of 125 here applied to the standard, which exhibits, notwithstanding its disorganization, much the fewest anomalies, it gives very nearly the true range after all. The morning hour of minimum noted on the separate record of the Observatory was 3 A. M. on the 20th, and half past 3 on the 21st, as shewn by the standard Barometer, the morning maximum being 9 A. M. that of the evening half past 11. —The afternoon minimum hour is half past 4. This gives an interval of nearly six hours betwixt the morning minimum and maximum; of seven and a half betwixt the latter and the minimum of afternoon; of seven betwixt this again and the night maximum, and of no more than four betwixt the last and the morning minimum. This, of course, strictly refers to the day in question, and to that only, though it will probably be found to be near that for the month of June on an average of years.

The mean amount of the ascending range betwixt 4 A. M. and 9 A. M. on the 20th, is .097, the maximum .124, the minimum 70; both these are suspicious,—the former is the reading of a playful and vivacious instrument, No. 3, which seldom keeps with its brethren, the latter of a high set, but very dull sluggish one, which generally falls behind in all movements whether in ascent or descent; the maximum difference amongst the seven amounts to .054.

The mean amount of descent, betwixt 9 A. M. and half past 4. P. M. on the 20th, is .122, the maximum 137, the minimum 102,—this again by No. 7, the greatest difference betwixt any two is .035.

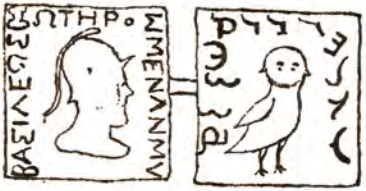
The morning descent from half past 11 P. M. on the 20th, to half past 3 on the 21st, is betwixt 70 or 71, according as the Instruments are taken by a fixed hour, or by the points of maximum and minimum attained at different hours.

This experiment I expect to be again able to repeat with a still larger collection of Instruments after the cold weather sets in; it is tedious and troublesome, and worthless, unless the Instruments be of nearly uniform make and of extreme accuracy. This, on the present occasion, was in all respects, the case.

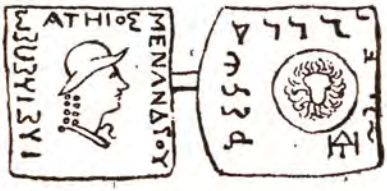
Bactrian Coins.

Menander.

1.



2



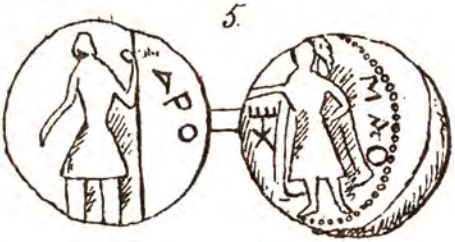
Apollodotus

3.

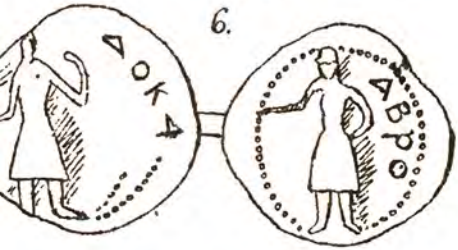
Mithraic Coins.

4

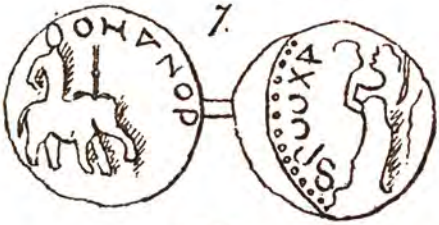
5.



6.

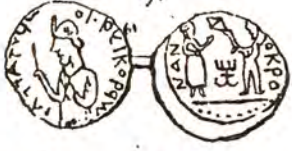


7.



8.

9.



10.

Over the Cell on the left hand of the large inscription at Nasick

Art. III.—*Observations on the Bactrian and Mithraic Coins, in the Cabinet of the Bombay Branch of the Royal Asiatic Society.* By James Bird, Esq.

In the progress of deciphering the cave inscriptions, on this side of India, I was led to the study of the Bactrian, Parthian, Indo-Scythian or Mithraic, Sassanian, and Kanaoj series of coins; and was not surprised to find proofs of an union between the *Bauddha* and *Mithraic* creeds; particularly after the deductions made by Mr. Prinsep on this subject, from his examination of the coins and relics, discovered in the *Tope* of *Manikyala.** Though an examination of our small cabinet may not add much to the obscure and lost portions of Indian history, it will nevertheless bring to light some new types of *Mithraic* coins; and is not without interest in the *Parthian* and *Roman* series: as the Parthian includes specimens of the coinage belonging to the *Christian kings of Edessa*, who were alternately in alliance with the Romans, and with their Parthian contemporaries, the kings of Persia. It may be yet further beneficial in extending the knowledge of numismatics among private individuals in this country; who, having directed attention to the collection of coins and medals, may be willing to submit for publication the objects of their research, and thus widen the field of inquiry, by having before them, for comparison, stores of antiquarian relics, capable of illustrating the past condition and mythology of ancient India.

The conquests on the Indus, made by the Greek sovereigns of *Bactria*, the *Seleucidæ*, the *Parthian* and *Sassanian kings* of Persia, introduced into that part of the country, called *Indo-Scythia*, a variety of coins, distinguished by *Mythological devices*, and *bi-lingual inscriptions*, some of which have been improperly classed, as belonging to unrecorded princes of Bactria, while they might be more truly ascribed to some of the Generals employed under the Seleucidæ, and to the Parthian and Sassanian satraps of Persia. In this department of oriental numismatics, notwithstanding the distinguished labours of Prinsep and Wilson, there remain ample materials for the investigation of others; and it is yet reserved for some one, possessing extensive historical acquirements, on the subject of

* Journal Bengal Asiatic Society for 1834, p. 438.

ancient times, and with a perfect knowledge of *Egyptian and Hindu* Mythology, to appropriate the several coins to the different tribes and dynasties to which they belong. Without presuming that I possess adequate acquirements for so great an undertaking, I may be permitted to add my mite to the stock of present knowledge on this subject; and if less successful than may be wished, in this investigation, my labours will doubtless be received with indulgence, where men of established reputation have left numerous *lacunæ* to be filled up.

Specimens of ancient Roman coins, in considerable number and variety, are to be found in our cabinet; though we are far from being as rich as we should be in this department, and are without any of those which have been dug up in various parts of this country. The testimony of *Arrian's Periplus* of the Erythrian sea, the knowledge of towns and rivers, on this side of India, evinced in Ptolemy's Geography, and the late discovery, in the neighbourhood of Coimbatoor, of five hundred and fourteen Roman coins, of the reigns of *Augustus*, *Tiberius*, *Caligula*, and *Claudius*, afford undeniable proof of the intimate connexion with India maintained by this people, during the first and second centuries of the Christian era, and at the period of their intercourse with the Parthians. Mr. Walter Elliot, of the Madras Civil Service, who is distinguished by like success and zeal in clearing up obscure portions of Indian history, informed me, by letter, that of these 514 coins, 134 were of the time of Augustus, 381 of the reign of Tiberius, 3 of Caligula, and 5 of Claudius. Roman coins have been previously found in the district of Coimbatoor: and the late Collector there, Mr. William Garrow, states that a silver denarius of Augustus was discovered in one of the ancient sepulchres of the country called *Pandukulas* * whilst a number of irregularly shaped silver coins, stamped, by means of a punch, with various devices, and not uncommon in Southern India, were obtained from another of the same tumuli. These remains were with good reason attributed by Mr. Garrow, to a race of *Pandu Kulas* or Pandya tribe of Madura; one of whose chiefs dispatched the well known *Embassy to Augustus*, as related by *Dion Cassius*, which brought to him from India letters *written in Greek* as stated by Strabo, on the authority of Nicolaus Damascenus.† Somewhat more than fifty years ago, many

* An account of these tumuli will be found in Vol. III. P. 324, Transactions Bombay Literary Society.

† Strabonis Geograph. Lib. XV. p. 720.

gold Roman coins of the second century were recovered from the foundation of an old Hindu temple, near Nellore, some account of which will be found in Vol. III of the Asiatic Researches. Besides these, several gold Roman coins were found, about three years since, in the neighbourhood of Sholapoor; and an *aureus* of *Trajan* from Cuddapah, with a *solidus* of *Zeno* from Madura, was obtained not long ago by Mr. Elliot.

Many of these Roman coins were doubtless introduced into India, in exchange for commercial articles of luxury, exported by the channels of the Red Sea and Persian Gulf; but some were probably brought by the *Jewish* and *Christian* refugees, who migrated to Mysore, in the *third* and *fourth* centuries: and with whose settlement, in India, commenced the cycle of sixty, which was formed on the model of the Chaldean *Saros*, and dates from A. D. 75.

The word *dinar*, to desiguate the value of a particular coin in circulation among the Hindus, came to be used in *Sanskrit*, from the period when the Roman coinage was introduced into India; and the occurrence of this term, whether in inscriptions on antique monuments, or in ancient Sanskrit works, will enable us to determine the comparative age of either. The principal silver coin of the *Roman Republic* was a *silver denarius*, after the model of the *drachma*, a leading designation of the Greek coinage, and Arrian, in his Periplus, mentions that *denarii*, both gold and silver, were among the articles exported from Europe to *Barygaza* or Broach.* In the Sanskrit inscription, from the *Bauddha* mound of *Bhilsa* in Malwa, translated by Mr. Prinsep, (Journal B. A. S. Vol. VI. p. 455,) the son of *Amuka*, subject to the great emperor *Chandragupta*, presents to the five temples of the all respected *Sramanas* (Bauddhas,) a piece of ground and twenty-five *dinars*, as an offering from the supreme Raja *Chandragupta*: who is not the *Sandracottus* of the Greeks, but was one of the family mentioned in the *Vishnu Purana*, and who ruled over *Magadha*, about A. D. 427, calculating from the death of Alexander the Great, according to the periods assigned for the *Maurya*, the *Sanga*, the *Kanva*, and *Andhra* dynasties of Hindu sovereigns. The name *dinar* again occurs in the *Raja Taringini*, a history of Kashmir, which states Toromana, younger son of Pravarasena,† struck dinars in his own name,

* See Arriani Periplus Maris Erythræi. page 28, Vol. 1. Geographiæ veteris Scriptores Græci Minores.

† History of Kashmir in As. Res. Vol. XVI. p. 37.

while he was yet only *Yava Rajya* or associated successor in the empire. This prince was cotemporary with Siladytia I. of Gujerat, who lived about A.D. 270—80;* previous to whose reign the Sakas, or Indo-Scythian tribes, had spread their power and influence throughout western India; and soon after founded the city *Valabhipura* in Gujerat, which gives name to a particular era commencing A. D. 319. According to the authority of the *Raja Taringini*, the ruler of *Ujain* in Malwa, about this time was *Sriman Hersha Vikramaditya*, the same as *Shapur* II, of Persia; who appears to have possessed himself of Sejistan, and other parts of Indo-Scythia; while part of Western India bore him allegiance under the authority of his satraps. Gibbon,† on the authority of Theodoret, states that the united forces of Persia and India were present while this Shapur besieged Nisibis A. D. 337, during the reign of Constantius; and that the King was obliged to relinquish the siege, and march for the banks of the Oxus, as the Scythian tribes, in the neighbourhood of Kabul, had invaded the northern part of his kingdom. This *Shriman Hersha Vikramaditya* of Kashmir history, who destroyed the *Sakas*, is no other than Shapur II, who, on the authority of Assemanus, instituted a persecution against the *Manicheans* and *Christians* throughout his dominions. Some of the *Mithraic coins*, and the *fresco painting* in a niche of the second idol of the caves of Bamian, belong to this period. But with these preliminary historical remarks, on the subject of coins, I proceed to illustrate those met with in our cabinet.

Bactrian Greek Coins.

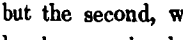
We only possess three coins of this series; two of which belong to *Menander*, and the other to *Apollodotus*. Eleven various coins of this class were presented to the Society, by Sir Alexander Burnes, during the

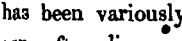
* This date is inferred from the copper plate grants of land, written in the cave character of the Sanskrit language, and obtained from Gujerat; which will be found in page 477, Vol. IV, for 1835, of the Bengal Asiatic Society, and Vol. VII. of the same work, page 966. The latter is plainly dated 365 Samvat or Vikramditya era A. D. 309, but Mr. Wathen, who translated the former, mistook the date of it for 9 of the Valabhi era; whereas it is dated, agreeably to the custom of the Balhara emperors of India, in the 32 year of the kings individual reign, or Sridhara Sena who was the predecessor of Siladitya I.

† Gibbon's Roman History. Vol. III. p. 133. In addition to Gibbon's authority, the Dissertatio de Syris Nestorianis, in parte secunda Bibliothecæ Orientalis, page LV. may be consulted.

year 1832, but were subsequently sent to him in England, previous to the publication of his work, and have been since deposited, I suppose, among the archives of the British Museum. Without disturbing the chronological data, on which late numismatists have affiliated the reign of *Menander* with the period of the *Scythian invasion*, B. C. 126, by which the Greek kingdom of Bactria was overturned, I may briefly notice, that both this King and his successor *Apollodotus*, prior to the discovery of their coins with bi-lingual inscriptions, were placed betwen *Euthydemus* and *Eukratides*, or B. C. 220, to 181. The devices of the *mummy* and feather, emblems of the Egyptian god Pthah, or the *Opifex Mundi*, found in conjunction with bi-lingual inscriptions, on the coins of Menander, like to those on the coins of the *Parthian kings*, *Phraates* IV and *Vologeses* I, but not in use before the time of *Eukratides* and the subsequent Roman connexion with the Parthians, must have been adopted when the intercourse between Egypt and India had become familiar. The occurrence of these devices, and of *Coptic inscriptions too*, on some of the *Mithraic coins*, which date subsequent to the Christian era, seem to confirm the accuracy of those chronologists, who place *Menander* and *Apollodotus low* down in the Bactrian scale.

MENANDER.

1. Square silver coin, middle size, head with helmet to the right; on the obverse, with a Greek inscription, round the edge ΒΑΣΙΛΕΩΣ ΣΩΤΗΡ°Σ ΜΕΝΑΝΔΡ°Υ. On the reverse, an owl, the Athenian emblem for Minerva, with an inscription round the edge in Bactrian Pali  or Maharaja Rattasa Minanasa.

2. Square, copper; middle size, head helmeted, to the right; inscription in Greek ΒΑΣΙΛΕΩΣ ΣΑΤΗΡ°Σ ΜΕΝΑΝΔΡ°Υ. Reverse, Medusa's head, the emblem of Minerva, with inscription, in Bractrian Pali  or *Maharajasa Rattasa Minanasa.* The first of Menander's titles, *Maharaja*, is the equivalent of the same in Greek; but the second, which has been considered a translation of *Soteros*, has been variously read by Prinsep and Professor Lassen. Mr Prinsep, after discovering the true nature of this Bactrian Pali, read the second epithet *Ladatasa*, or *Nandatasa;* but Lassen conjectured the reading to be *Tadarasa*, the Prakrit translation of preserver. Neither of their readings have been deemed satisfactory, and I doubt its being meant as a translation for *Soteros*, but is on the contrary the Pra-

krit corruption for *Aratta*, or *Arhata*, signifying the venerated. It is not a little singular, Plutarch mentions *Menander*, was so beloved by his subjects, that, on his death, different cities contended for his ashes, and adjusted their disputes by dividing his relics amongst them; while a similar story, which is told of *Gautama*, or *Sakya Sinha*, is current among his Bauddha followers. Professor Wilson, in his appendix to the History of Kashmir, observes that, in the *Mahabharat Kerna Parva*, the *Arattas* had for their chief city *Sakala* or *Sagala*; the same which was known to the Greeks by the name of *Enthydemia*. In the Parthian mansions of *Isiodorus Characenus* it is said to belong to the *Sacæ* or *Scythians*; and under the name of *Sagala* it occurs in one of the western cave inscriptions. The *Arattas*, under the corrupted Prakrit name of *Rattas*, are mentioned in Mr. Walter Elliot's Hindu inscriptions, as having been subdued, by *Teila Chalukya*, in Saka 895, or A. D. 919. Their country was called *Kankara*; which *Masudi*, in A. D. 915, describes as extending along the Indus, and sea coast of India, from the country of *Khozar* in the neighbourhood of the Caspian.

APOLLODOTUS.

3. Round copper figure of Apollo, looking to the right, and supporting by his left hand his arrow. Inscription in Greek ΒΑΣΙΛΕΩΣ ΣΩΤΗΡ°Σ ΑΠ°ΛΛ°Δ°Τ°Υ. Rev! Tripod, with inscription in Bactrian Pali, more perfect than that on the coins published by Mr. Prinsep and Professor Wilson. It may be read 𑀫𑀳𑀭𑀚𑀲 𑀬𑀤𑀢𑀲 𑀅𑀧𑀮𑀤𑀢𑀲 or Maharajasa Yadatasa Apaladatasa. A similar coin will be found figured in Wilson's Plate IV; fig. 16, with the Pali inscription very indistinct. In our coin the second epithet for ΣΩΤΗΡ°Σ is doubtless *Yadatasa*, and cannot be a translation of the Greek term, but is meant to designate a tribe, as in the former coins of *Menander*. I am disposed to conjecture that it is meant to designate the *Yadavas*; the tribe from which *Krishna* sprung, which was a northern one. The coincidence between the legend of *Krishna* slaying the serpent *Kaliya*, in the sacred river *Yamuna*, and that of the *Pythian Apollo* killing the snake at *Delphi*, must be more than casual: and, as *Krishna's appellations* of *Govinda* and *Kesava*, in *Sanskrit*, are direct translations of Apollo's titles, in *Greek*, viz. Nomios νομιος (the herding) and ευχαίτης Eukhaites, (well haired), there are strong reasons for presuming that the legends of the *Hindu Krishna* have been borrowed from those of the *Grecian Apollo*.

Across the field of this coin, written in Bactrian Pali, we meet with the syllable *Kra*; which, written in Greek, occurs on the coins of the Bactrain princes, *Enthydemus* and his son *Demetrius*. This appellation for the *Sun*, is sometimes written *Kraka*, as on the coins of the Parthian king *Vologesis* I, who lived A. D. 52; and seems of similar import as *Grag* in Armenian; which Mr. Newman, in his translation of the History of Vartan, page 81, says was commonly used by the Armenians to designate the *holy fire*, which the Parsees name, in *Zend*, *Azeran*. A curious passage, in *Arrian's* Parthics, says that *Spartembas*, a friend of the conqueror *Bacchus*, dying, left his kingdom to his son *Budyas*, who after a reign of 20 years, was succeeded by his son *Cradevas*. The resemblance of *Budyas* to *Buddha*, and the perfect Sanskrit termination *Deva*, are striking coincidences: and the very name of the deity *Kra Deva*, occurs in the inscription from Nasick, lithographed at the bottom of the present plate of coins. It reads *Sidham! Rajino Kshaparatasa Kshatrapasa napapanasa, dhipati dinak putasa, upavedatasa, Kradevanya datumitrya daya dhama: navarka*, of which the *translation is—Be it accomplished. The compassionate gift of the sinless Satrap of King Shapur, son of the Supreme Lord, the day producer, follower of the minor Veda, to Kra Deva, the bestower of Mitra. The new sun, or year. The name* of *Kra Deva* again occurs in Inscription XIV, Plate XLIV, of my work on the Caves of Western India.

Mithraic coins.

4. Middle size, copper. Standing figure to the left, in cap, tunic, and boots, who holds a spear in his left hand, and is sacrificing over a fire altar. Inscription Greek, but of which, the usual BACIΛЄVC BAEIΛ& ѠN KANHPKI KOPANO part is only visible. R: Figure of of a female to the right, clad in a long vest, and holding in her right hand a flower or branch, which is carried to the nose after the manner of the fire worshippers: to which practice, Job makes allusion, in Chap. XXX v. 26—28.

If I beheld the sun when it shined, or the moon walking in brightness,

And my heart hath been secretly enticed, or my mouth had kissed my hand;

This also *were* an iniquity *to be punished by* the Judge, for I should have denied the God *that is* above.

Halo round her head, and inscription on the edge, in Greek, NANAIA, the appellation for the Persian Diana, or *Nanæa* of the Maccabees; whose temple, at Elymais, or Persepolis, was plundered by Antiochus Epiphanes. This goddess, among the *Chaldæans*, *Syrians*, and *Phœnicians*, was the deified moon, and sometimes the morning star, named *Baal-at Samin*, or the Queen of Heaven. She was the same as the *Mithra* of the Persians, the *Myllita* of the Assyrians, and the *Alitta* of the ancient Arabs.

5. Copper. Standing figure of a *Magus*, or priest of the fire-worshippers, who under this form usually represented the sun. Inscription in Greek letters; of which the first part APΔ is only legible, but is usually followed by the word OKPO, both combined signifying the excellent *Sun*, as APΔ, or APTA, according to Selden and Hesychius, means great or splendid, and OKPO is a Zend or Pali corruption for *Arka* the sun, as rightly interpreted by Mr Prinsep. Reverse, female figure to the left, sacrificing over a fire-altar; Nimbus round the head; Coptic inscription on the edge MAO, which is the Coptic word ⲘⲀⲰ mother, and the same according to Plutarch as μουθ the goddess Math, the Egyptian *genetrix*, and the same as the Persian *Nanaia*.

6. Copper. Figure of a *Magus* looking to the left; part of the Greek inscription *Ard Okro* on the edge. Reverse, figure looking to the left, clad in a loose tunic. Inscription on the edge AΘPO, the Zend name for fire, and here the symbol for *Nanaia*; who, whether considered as the *Moon* or the planet *Venus*, was one of the seven fires, or planets, to which the Persians dedicated their fire temples.

7. Copper. Male figure riding on an elephant; inscription on the edge in Coptic Greek letters ONAN OPO, meaning the good king, or an appellation for the sun; which is sometimes written PA ONAN OPO, signifying the sun the good king. This inscription has been usually considered a Pali one, and read PAO NANO PAO, being interpreted *King of many kings*. It is true that *Nana* in the Pali language means *various*, and *manifold*;* but here it is the Coptic ⲚⲀ ⲚⲈ or ⲚⲀ ⲚⲞⲩ signifying good, applicable to PA, or PH, the name of the sun: and that this interpretation is the correct one, seems evident from the fact of the reverse of this series of coins bearing a Coptic inscription ΦAPO *Pharo*, which has hitherto remained without explanation, but is nothing more than the Coptic definite

* See Pali Grammar by the Rev. B. Clough; P. 73.

article Φ with the word APO for ΟΥΡΟ *the King*; or otherwise a name for the Egyptian god Horus, or a form of the sun. One of this series of coins, now in my possession bears the following inscription, ΕΛΙΗΡΟ, the word *El* being among the Cabbalistic Jews intended to designate one of the numerous *intelligences* or divine orders of beings, formed to execute the commands of the first emanation from God, the primitive man or king of light; while ΙΗΡΟ, written on some of the coins ΟΗΡΚΕ, is only an appellation for Horus; who, after the Egyptian manner, is sitting on the reverse of this coin supported by an ornamented seat or lotus. On the reverse of No 7 figure of a female, and imperfect inscription of ΑΡΔΟΚΡΟ.

8. Small, Copper; standing male figure, and inscription ΡΑΟΚΑ. Reverse, standing figure looking to the left; rayed nimbus round the head; inscription on the edge ΜΙΑΡΟ intended for *Mithro*, or the Persian name for Nanaia.

9. Silver, small size. Bust of a king looking to the left, and holding in his right hand a branch, as if worshipping the sun; inscription in Greek ΑΡΡΑΤΟΡΟ ΟΗΡΚΙ ΚΟΡΑΝΟ, meaning *King of the Arratas Oerki of the tribe Karauna.* The *Karaunas*, or *Korahos*, were a Græco-Indo-Scythic tribe of robbers in the Punjab, who are mentioned by Marco Polo.* Reverse, female and male figure, sacrificing in conjunction over a fire-altar, the former named in Greek letters ΝΑΝΑ, and the other ΟΚΡΟ; being otherwise figures of the *moon* and *sun*, similar to the two colossal statues at Bamian, which were probably sculptured B. C. 337 as Clemens of Alexandria tells us, on the authority of Berosus the Chaldæan, that Artaxerxes, the son of Darius, and grandson of Ochus, set up statues of the Scythian Venus, at Ecbatana, and among the Persians and Bactrians, and pointed out that such should be worshipped.†

10. Copper, small size. Figure of a saint, seated under a tree, like the wood hermits of old. Reverse, standing figure, whose head is surrounded by a nimbus; inscription in Coptic Greek letters ΝΑΝ for ΕΝΔΝ, the good.

It has been admitted by those most competent to judge, that an intimate connection exists between the metaphysical systems of the Hindus and those of the Greeks;† and it is not less obvious, from the tes-

* Travels of Marco Polo, P. 86.

† See Wilson's preface to Colebrooke's Translation of the Sankhya Karika, or Memorial Verses of the Sankhya Philosophy, p. IX.

timony of the Bactrian, Parthian, and Indo-Scythian coinage, that regarding the mythology, and idolatry of the two countries, a system of *eclecticism*, on the subject of their gods, from the period when the Greeks who accompanied Alexander the Great into India, first discovered that the *Surasení* worshipped deities similar in character to Bacchus and Hercules. Herodotus, the father of history,* tells us that the ancient Persians had neither statues, temples, nor altars; but worshipped the expanse of the firmament, under the name of *Jove*, (or the Hindu Indra,) adding thereto as deities, the sun, the moon, earth, fire, water and the winds; till in after times they copied the Assyrians and Arabians, by introducing among their deities *Mithra*, or the celestial Venus; and the same with *Nanaia* of our Mithraic coins, whose statues were originally set up by Artaxerxes, the grandson of Ochus. *In her physical character*, this goddess represented the natural fecundity of the earth; and in her *astral one*, the moon or the passive influence of the sun; and is hence called on the coins *Mao*, or the mother goddess. She is sometimes called in inscriptions *Myrionyma* or the many named; and when the government of Bactria and countries in the immediate neighbourhood of the Indus, passed from the power of the Greeks and Parthians, into the hands of the Indo-Scythian tribes, the latter appear to have adopted the worship of this goddess; whose name yet survives in Afghanistan, under that of *Bibi-Nani*, signifying in the Pali language, the *wise lady*. The last is an equivalent for *Prajna*, or *deified nature*; known among the *Bauddhas* as *Dharma*, the type of inert matter, not yet evolved into various forms. This is at least her physical character connected with the metaphysical theories of generation; but in her celestial character, she is the Nanaia of the *Ard-okro coins*, the Chinese *Tienhow*, (the queen of heaven) named also Shing-moo, (the holy mother,) or the passive principle and power of conception.

From the few coins and facts now before us we should not be warranted in tracing further the connection between the deities of the Greeks, Persians, and Indians; and a more comprehensive series of coins is requisite to develope the influence which the mythologies of these countries mutually exercised on each other, through an interchange of kindred subtilties.

* Book 1 Para. CXXXI.

Art. IV.—*A Chemical and Microscopic Examination of the Rock Salt of the Punjaub.* By Herbert Giraud, M. D.

Until very recently, the only accounts we have had of the salt mountains of the Punjaub, have been of a geographical and physical character; the most accurately descriptive of which is that by Sir Alexander Burnes in his travels into Bokhara. (vol. i. p. 52.)

Attention however has been lately directed to the geological features of this interesting range of hills by Dr. Jameson's report of his Deputation by Government, to examine the effects of the great inundation of the Indus.* So far as regards the geographical and geological condition of the salt range, as it extends from Jalalpoor on the Hydaspes, to Maree on the Indus, this report is tolerably complete; but it may require a more extended comparison of the organic remains of the several rocks to determine how far the limestone which alternates with the red sandstones and red marls, the sandstones and marls themselves, and the shelly limestone, are the equivalents respectively of the magnesian limestone, the new red sandstone, and the mauschelkalk of Europe.

*. "First report of Dr. Jameson of his Deputation by Government to examine the effects of the great Inundation of the Indus." Journal Asiatic Society. No. 135, 1843.

I cannot refer to this paper without directing attention to Dr. Jameson's account of the gypsum of Jalalpoor, which he conceived would be so important an article of importation into Bombay, and might be most advantageously used in the public buildings and for making ornamental works.—H. G.

Note by the Secretary.

A quantity of gypsum (*Pirre áplatne* de Paris) was imported into Bombay some years ago, from the Persian Gulf, where it is found abundantly, but I am not aware of the result of the experiments that were probably made with it. Judging from the specimens in the museum, it is not very pure, yet sufficiently so for most purposes for which it would be required in this country. Extensive rocks of earthy and granular sulphate of lime exist in the western parts of Marwar, and selenite occurs in various places in Kattiawar, also I found it at Dholgaum in the Rajpeepla country.

The following interesting description of Callabaugh is extracted from the introduction to Mr. Elphinstone's Cabool: — "Calla-baugh, where we left the plain, well deserves a minute description. The Indus is here compressed by mountains into a deep channel, only three hundred and fifty yards broad. The mountains on each side have an abrupt descent into the river, and a road is cut along their base, for upwards of two miles. It had been widened for us,

The salt from these mountains has never been in high repute for its purity, and is unfit for most culinary purposes; this has been attributed to the presence of magnesia, although chemical analysis has never been had recourse to, to point out the nature of its foreign ingredients. There are however many features in its general character and appearance, as well as many points of relationship with rock salt from other parts of the world, and with the salt of the ocean that seemed to promise to invest with interest its microscopic and chemical examination. A large quantity of it has lately been imported into Bombay, and from this Dr. Malcolmson kindly favoured me with some well selected specimens.

As it is usually met with here, the salt is in large amorphous masses, varying in colour from white and pink to brick-red; with here and there, the colouring material aggregated into extremely thin laminæ and filling minute vesicular cavities. In a moist atmosphere it is extremely deliquescent, owing to the presence of chloride of calcium; and, as it dissolves, the colouring matter is separated, and deposited in the solution. This colouring material is common, in variable quantity, to rock

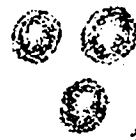
but was still so narrow, and the rock over it so steep, that no camel with a bulky load could pass; to obviate this inconvenience, twenty-eight boats had been prepared, to convey our largest packages up the river. The first part of this pass is actually overhung by the town of Calla-baugh, which is built in a singular manner upon the face of the hill, every street rising above its neighbour, and, I imagine, only accessible by means of the flat roof of the houses below it: as we passed beneath, we perceived windows and balconies at a great height, crowded with women and children. The road beyond was cut out of solid salt, at the foot of cliffs of that mineral, in some places more than one hundred feet high above the river. The salt is hard, clear, and almost pure. It would be like chrystal, were it not in some parts streaked and tinged with red. In some places, salt springs issue from the foot of the rock, and leave the ground covered with a crust of the most brilliant whiteness. All the earth, particularly near the town is almost blood red, and this, with the strange and beautiful spectacle of the salt rocks, and the Indus flowing in a deep and clear stream through lofty mountains, past this extraordinary town, presented such a scene of wonders, as is seldom to be witnessed. Our camp was pitched beyond the pass, in the mouth of a narrow valley and in the dry bed of a torrent. Near it were piles of salt in large blocks (like stones at a quarry,) lying ready for exportation, either to India or Chorassan. It would have taken a week to satisfy us with the sight of Calla-baugh; but it threatened rain, and had the torrent filled, while we where there, our whole camp must have been swept into the Indus" Page 58—60. 2d.—Ed.

1.

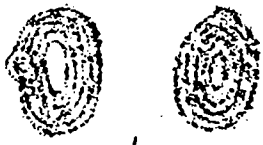
2.

3.

4.



5.



6

salt from almost every locality, and has been too hastily referred by Chemists and Geologists to the presence of peroxcide of iron; although it is known that other foreign ingredients have in many instances been found imbedded in rock salt, such as silica, carbonate and sulphurat of iron, which occur in the salt of Zipaguira in Tropical America. Sulphurets of lead and zinc in that of Halle in the Tyrol; while *organic matters* such as liguites, fruits and minute shells, have been found in the salt of Williezka in Poland.*

Since the astonishing discoveries of Ehrenberg, which have not only displayed the internal organization of the myriads of living infusoria, but have also brought to light the fossil remains of generations upon generations of the animalculæ of early geological epochs, microscopic examinations of the aqueous rocks, particularly of those of the limestone family, have disclosed such vast quantities of organic remains in positions in which the presence of organic matter was least anticipated, that the history of no rock or compouud mineral can be considered complete, until it has passed under a strict microscopic examination. To this I submitted the red colouring matter of the salt, and found it to consist altogether of organic remains.† Amongst a confused assemblage of matter, either too minute in its particles, or too broken up into irregular forms to distinguish any thing like the traces of organization, there appeared many bodies which were evidently the remains of infusoria. That marked 1. in the accompanying drawing appears to correspond with the genus "Synedra" of Ehrenberg; — it measures $\frac{1}{259}$ inch in length and $\frac{1}{0003}$ inch in breadth. No. 2. resembles, if it is not identical with the "Gaillonella ferruginea" (Ehrenberg) the animalcula which constitutes, the colouring matter of the iron ochre, and is therefore invested with peculiar interest as appearing in the colouring matter of this salt. Each of the moniliform segments of which it is composed, measures $\frac{1}{1000}$ inch in diameter. No. 3. appears to be related to the last, and should probably be referred to the same genus. No. 4. is abundant in the salt; it has none of the characters of fossil infusoria, but may possibly be the scale of some small fish. It is so perfectly

* Traité elementaire de Mineralagie. Par F. S. Bendant, Tom. 2nd Paris, 1832.

† The Microscope I use is one of Chevalier's acromatics; power four hundred linear.

transparent, that the concentric lines on its surface are only discovered by causing the light from the reflector of the microscope to pass obliquely through it.

The vegetable remains consist of extremely minute filiform bodies having the characters of confervæ, and consisting of simple elongated cells, attached end to end to each other. (No. 4.) There are also amongst these, minute orbicular bodies which appear to be the spores of these confervæ. (No. 5.) The matrix, in which these distinctly organic remains are contained, is an aggregation of particles too minute and indefinite in form for their nature to be determined; it is probable that a great proportion of them are the ova of the infusoria.

These microscopic examinations were conducted with the greatest care, as it was conceived that farther light might be thrown upon a recent discovery by M. Payen* of the existence of myriads of minute crustaceæ in

* The red colour is observed in the saline water of some springs, as in the evaporating vats of Salumba in upper India, described by Mr. Gubbins of the Bengal Civil Service in the 7th volume of the Journal of the Asiatic Society of Bengal, page 363. The following extract is from a memorandum on the Maldiva Islands by Captain Moresby, I. N. read to the Bombay Geographical Society on the 3rd November 1836; but which does not appear in the proceedings. It throws much light on the cause of the rock salt of very distant regions having the same peculiar red colour.

"In the Milla-doo Madou Atoll are several islands (10 or 12) which have lagoons in them, which the dry land and trees completely surround; in some of these lagoons the water in them is brackish; they are not deep (from 2 to 6 feet); the bottom soft mud and very offensive in smell. No live coral grows in these lagoons; and shells are produced here, which are not found in the sea. In some of the lagoons at very high tides and strong breezes, the sea sometimes finds its way into them and again fills with water what was fast drying up.

At Markandoo Island which is on the centre and east side of the Atoll, there is a lagoon exactly in the centre of the island, which has no connection with the sea, nor ever had, the natives say; it is about one and a half feet deep, the water of a *deep red colour*, perhaps from decayed vegetable matter; it is brackish *and abounds in small shrimps;* and what is extraordinary, its margin is covered with mangrove trees, which are seldom or never found on any of the other other islands. This lagoon, the natives say is kept full by the rain, and that it never gets dry."

The red colour of the water no doubt arises from the shrimps or the animalculæ on which they feed, and not on the vegetable matter, to which is to be ascribed the offensive smell of the mud caused by the decomposition of the sulphates in the brackish water. — Ed.

the waters of tropical seas and of certain salt lakes, and which have been found to be the cause of the red colour of the salt, which may be obtained by evaporation from these sources. These crustaceæ have been referred by M. Andoin to the order Branchiopoda.

In the salt however I have in vain attempted to discover a single articulation of these creatures.

Chemical Analysis.

One thousand grains of the dried salt with boiling distilled water afforded a clear solution, and a red pulverulent residue.

1. The qualitative examination of the solution indicated the presence of the following salts:—

Chloride of Sodium.
Do of Calcium.
Sulphate of Magnesia.

It remained unaffected by the action of hydrosulphuric acid. Neither bichloride of platinum nor tartaric acid, (the tests still adhered to by Chemists for determining the presence of potassa,) gave the least indications. The proportion of lime was determined by means of oxalate of ammonia—the precipitated oxalate of lime being converted by ignition into carbonate, from which the proportion of lime, and hence of chloride of calcium, was calculated.

It is always difficult to separate magnesia from the other bases with which it may exist in combination. Most Chemists calculate its proportion from precipitates afforded either by carbonate of potash or by phosphate of soda with free ammonia; both these processes however are beset with sources of inaccuracy; for, by the first, the neutral carbonate of magnesia, precipitated by neutral carbonate of potassa, is decomposed by the action of water in such a manner as to give rise to bicarbonate of magnesia, which is soluble in water, and even though the magnesian solution may be boiled with an excess of carbonate of potassa, yet a portion of magnesia will still remain in solution. The precipitate also of phosphate of ammonia and magnesia is liable to the same inconvenince, particularly as repeated washings are necessary before it is converted by ignition into the neutral phosphate of magnesia. Instead therefore, of either of these

methods, I made use of caustic potassa, by which magnesia is precipitated even better than by carbonate of potassa, and in hot water is so sparingly soluble that the loss is too insignificant to be of any importance.

2. In examining the composition of the *red insoluble residue* I found it to remain quite unaltered under the action of boiling nitric and hydrochloric acids, proving that it could not be an oxide of iron; conceiving it, therefore, to be a silicate of some base, I fused it with carbonate potassa and then by submitting the fused mass to the action of hydrochloric acid, it gave abundant indication of the presence of iron.

Hence the chemical condition of this mineralized organic matter is identical with that of the iron ochre, and it is siliceous like Tripoli, both which are almost wholly composed of infusorial remains.

The following is the composition of 1000 grs. of the salt:—

Chloride of Sodium	966.11
Sulphate of Magnesia	17.93
Chloride of Calcium.....	14.36
Silicate of Iron	1.6
	1000.00

I find upon inquiry that this salt is much used as an aperient amongst the natives of Bombay, and it is probable that from the proportions of sulphate of magnesia, and chloride of calcium in its composition, its properties resemble those of many saline mineral waters; as those of Leamington in the new red sandstone district of Warwickshire.

V.—Metrical Translation of the 1st Book (Sarga) of the Raghuvans'a, a Heroic Sanskrit Poem, by Kálidása.

By the Rev. J. Murray. Mitchell.

Introductory Note.

A few preliminary observations will be of service in rendering the following translation from the Raghuvans'a interesting to English readers in general. The remarks now to be submitted will be of the most simple and elementary kind, embodying little or nothing that is new to Oriental

scholars, but probably not, on that account, the less useful to the class of readers for which they are intended.

We may conveniently divide Sanskrit literature into two parts, sacred and profane. It is by no means easy in all cases to draw the distinguishing line; but the two-fold division is nevertheless perfectly just. Generally speaking, the profane portion of Sanskrit literature, when estimated by the laws of criticism and taste, is far superior in merit to the part that is deemed more peculiarly sacred. The most indulgent criticism can scarcely discover any poetical merit in the Vedas and Puránas; while on the other hand the most fastidious taste must admit the beauty of many passages in the dramatic, heroic, and pastoral, poetry of the Hindús.

Kálidása, the author of the Raghuvans'a, is one of the greatest, if not the very greatest, of the profane poets of India. His name is already familiar to the literary public, having been introduced to notice by Sir W. Jones, in his elegant version of the drama S'akuntalá. In attempting to form an estimate of the merits of Kálidása, we encounter, in the very outset, a formidable difficulty, in endeavouring to ascertain whether or not there has been more than one poet of the name. It is about as certain as we can consider any event in Indian history to be, which is recorded merely in books, and not engraved on copperplates or the ever-during rock, that Kálidása flourished at the court of Vikramáditya. Yet it is nearly equally well ascertained that Kálidása flourished at the court of king Bhoja; and it is no easy matter to reconcile the two statements. Jones fixes his era in the century before Christ; Mr. Elphinstone inclines to the fifth century; Colebrooke and Professor Wilson say, at least 900 years ago.* Professor Wilson, in a later work than the one we have just quoted, fairly cuts the knot, by supposing that there were at least two poets, bearing the name of Kálidása. He appears to do so on the ground of the great diversity of style, between the writings generally ascribed to Kálidása and the Nalodaya. The writings of Kálidása are in general characterized, not only by exceeding elegance, but by perfect good taste;—while the Nalodaya, in violation of all the canons of taste, is, as Colebrooke expresses it, "a series of puns on a pathetic subject." Without entering at length into this question, we shall merely remark, that if Kálidása had lived at the period when the Sanskrit language had attained the

* Wilson's translation of the Meghadúta, p. vii.

highest stage of refinement, and just before its corruption began, he might possibly have been the author of the Nalodaya as well as the Raghuvans'a. Such a man, wielding at will the resources of the most perfect language ever known, was under a strong temptation to attempt, as in the Nalodaya, some of those wondrous feats in versification, from which the good taste of the West has not preserved European literature. Poets very frequently (to use the language of Wordsworth,)

Have felt the weight of too much liberty,

and of their free choice they have circumscribed that liberty often by sufficiently odd expedients. Besides, it may be questioned, whether good taste is a uniform characteristic of the undoubted writings of Kálidása. Some instances might be pointed out of what are technically called *conceits*, even in his most elaborate works.

Assuming then the probability of there having been only one Kálidása, we must admire the greatness and variety of his powers. The commendations which have been heaped on the play of S'akuntalá, shew, that in the estimation of the best critics, Kálidása is reckoned the prince of Hindú dramatic poets. Jones has styled him the Shakspeare of India. Two other dramas are attributed to his pen, and these are not unworthy of the author of S'akuntalá. In the Raghuvans'a we have a specimen of heroic, or what may be denominated epic, poetry. We have also, the Kumára Sambhava (the birth of Kumára;) and the Meghadúta (the Cloud-messenger), beside the S'rúta Bodha, a treatise on prosody, and the disputed Nalodaya, all probably from his pen. Probably, the greatest effort of the genius of Kálidása is S'akuntalá. He excels more in tenderness than sublimity, and the plot of the drama of S'akuntalá affords full scope to the bent of his genius. When we speak of the epic poets of India, let it not be supposed that India can boast of epic poetry of the same kind as that of Europe. The rules of Aristotle would fall with crushing weight alike on Vyása, Válmika, and Kálidása. But apart from all factitious distinctions and laws, it must be confessed, that if sustained elevation of thought and feeling be deemed essential to an epic poet, Kálidása must forego the title. Very seldom does he give utterance to any very lofty sentiment; seldom does he himself kindle, or cause the minds of his readers to kindle. His merits, however, are still considerable. We find in the Raghuvans'a, exact and elaborately minute descriptions of natural scenery, proving, that Kálidása had attentively studied nature, and studied her with a poet's

eye. Tenderness has been already mentioned as one of his excellencies. His comparisons, similes, allusions, and figures of all kinds, are most abundant; they are always at the least pretty, and sometimes beautiful. In regard to language, Kálidása ranks exceedingly high in the estimation, both of his own countrymen and European scholars. On this point, it would be somewhat presumptuous for one, whose acquaintance with Sanskrit is of no long standing, to express any very decided opinion of his own. One thing, however, is evident to the merest beginner. The style of Kálidása is elaborate and refined in the highest degree; the consummate skill of the artist is visible throughout; the polish indeed is sometimes excessive.

A good deal has already been accomplished, towards introducing the writings of Kálidása to the notice of the European public. The drama of S'akuntalá has been rendered into English prose, by the masterly hand of Jones. Another drama, Vikrama and Urvasí, has been translated by Professor Wilson, in his well known and esteemed work, the Hindú Theatre. A beautiful little poem, the Meghadúta, or Cloud-messenger, has been rendered into English rhyme by Professor Wilson. The Kumára Sambhava and the Raghuvans'a have been translated into Latin prose by a German scholar, Adolphus Frederic Stenzler. The latter two works have been published along with their Latin versions, by the Oriental Translation Committee. Reference will be made to the merits of some of these works by and by.

The Raghuvans'a, the first book of which is now offered in a metrical English version, consists of 19 books. The exploits of the race of Raghu form its subject. The line of kings, whose history it contains, is a pretty long one, but the poet at pleasure compresses the narrative of a reign into a few stanzas, or extends it to several cantos. Eight entire cantos are occupied with the history of Ráma, the son of Das'arath. In this part of his work, Kálidása comes into competition with the author of the great mythological poem the Rámáyana. He will not suffer by the comparison. Schlegel and other German writers of high name have been profuse in their commendations of the Rámáyana, but most men will be disposed to side with Colebrooke on this question. Colebrooke does not consider the Rámáyana to possess poetical merit of a high order, but includes it with the sacred poems in general, which he characterizes as "flat, diffuse, and no less deficient in ornament, than abundant in repetitions." From this cen-

sure he excepts, and justly, the chief profane poems. No part of the Raghuvans'a, so far as I know, can be pronounced "flat" or "deficient in ornament." On the contrary, over-refinement, and a far too lavish use of poetical diction and imagery, generally characterize it.

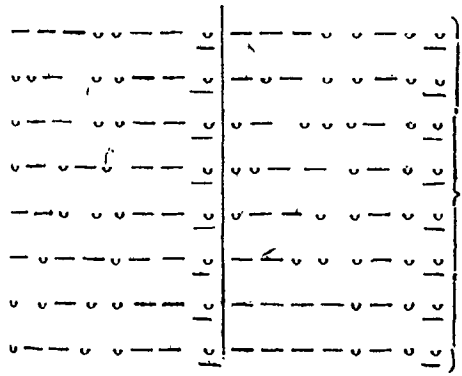
Into the moral character of the Raghuvans'a, I shall scarcely enter. With the exception of the last canto, it is less faulty than might have been expected of the production of a Hindú poet. The last canto, however, is exceedingly objectionable.

As a translation of the Raghuvans'a into Latin prose, has already been given to the world, it may be asked, what need there is of offering a new version of any part of it. Probably, had the Latin version in question, been executed with any considerable degree of spirit and elegance, the following translation of the first canto would not have been thought of. But apart from its total want of elegance, the fact that Stenzler's Latin version is in prose, is a strong objection to it. With the exception of the very highest poetry, as for example that of the Sacred Scriptures, where the sublime elevation, or the fervid devotion, of the sentiment does not require the aid of poetical measures to sustain it, there is perhaps no species of metrical composition in the world, that will bear translation into literal prose. What becomes of the fire of Pindar, or the *curiosa felicitas* of Horace, what of the majesty of Virgil, when those writers are presented to us in a prose translation? And what of the nameless and undefinable fascination of the music that breathes from the language of every true poet?

Assuming then, that a metrical translation is preferable to a prose one, ought it to be in rhyme or blank verse? Generally speaking, it can be much more faithfully executed in the latter. Translations into rhyme generally abound with factitious, not to say spurious, ornaments. The chief objection to a blank verse translation is the difficulty of making it sufficiently musical. In all other respects it is much preferable to rhyme.

The stanza in which the first, fourth, tenth, twelfth, fifteenth and seventeenth cantos of the Raghuvans'a are composed, is called by Sanskrit Grammarians, Anushtubh. It may be called the heroic stanza of Sanskrit poetry. It is far more frequently used than any other in their great poems, such as Manu, the Mahábhárata and Rámáyaná, and the Puránas. It bears a resemblance to the measure which is called in the technical language of Latin grammarians, Iambic Tetrameter. An English reader

will understand its general construction, if he supposes two lines of the octo-syllabic measure so much used by Scott, thrown into one, with the rhymes omitted. In the Sanskrit poets, a shloka or stanza consists of four parts of equal length, two of which are written in one line. A shloka is in English terms a couplet, with a distinct pause in the middle of each line. The following marks will shew the construction of the first four stanzas of the Raghuvans'a.



The mark ⏑ denotes a short syllable.
Do — a long syllable.

It will be seen from the above specimen that each line is kept rigidly to its prescribed *number of syllables*. Each half-line consists of 8; and therefore the entire shloka, of 32 syllables. In this respect the Sanskrit poets enjoy less liberty than the Latin and Greek, who in most metres can vary the number of syllables within a considerable range. But the Sanskrit poets enjoy very great liberty in regard to the *quantity* of the syllables they employ. The four first syllables in each half-line are long or short at pleasure. The last syllable of each line is also long or short.

On the whole, the best idea of the Anushtubh may be obtained from a specimen like the following:—

I sing a race from birth stainless; successful in each bold emprize;
To ocean's bounds they were victors; and borne on cars to heaven on high;
The sacred fire they kept duly; all watchful they in duty's hour;
Fell on the guilty due vengeance; no suppliant craved their grace in vain.

The reader who has been accustomed to the rhythm of English verse only, will feel a shock at the middle of each line, arising from the substi-

tution of a Spondee for an Iambus in the fourth foot. But the reader who is acquainted with classic metres will recollect the Scazon or Choliambus (limping Iambus), frequently used by Catullus,—as e. g. in the well-known ode:—

Peninsularum, Sirmio, insŭlārūmque.
Ocellē, quascunque in libentĭbus stagnis
Marique vasto fert uterquĕ Nĕptūnus.
Quam te libenter quam que lætŭs inviso.

In these lines, at the sixth foot, we have the Spondee, and it has the same effect on an ear accustomed only to English metres, as in the Sanskrit metre under review.

In the following version of the first canto of the Raghuvans'a, the number of syllables which each line has in the original is exactly followed in the greater part of the translation. At the 35th stanza a syllable is omitted at the commencement, which changes the verse to Trochaic. The Trochaic measure is kept up to the 60th stanza.

The Spondee at the end of the first hemistich of each shloka has not been attempted. It does not accord with the genius of the English Iambic stanza.

Occasionally, the pause, for variety's sake, has been removed from the middle of the verse. I am not aware that this is ever done in the original.

Occasionally also elisions (as they are generally, though not very correctly, called), have been introduced. In the hands of one who skilfully wields the English measures, elisions tend greatly to the beauty, as well as the variety, of the verse,—as in the line of Milton,

O'er many a frozen, many a fiery Alp,—

in which there are no fewer than three such elisions. Indeed, justice cannot be done to our English metres without the occasional use of elisions. They have accordingly been sometimes employed in the following version.

METRICAL TRANSLATION OF THE 1st BOOK OF THE RAGHUVANS'A, AN HEROIC SANSKRIT POEM; BY KA'LIDA'SA.

The pair like thought and speech * conjoined (that I may thought and speech obtain)
The world's great parents, I invoke,—Pârvatí and the Lord supreme.
But what the sun-descended † race! the Poet's feeble genius what!
Ah! fondly, on a fragile raft, I tempt a wide and stormy sea;—
I can but prove a laughing-stock, aspiring thus to bard's renown,
As if a pigmy strained his arm to reach the high o'erhanging fruit.
Yet, since, by ancient bards prepared, a pathway to the theme leads on,
I pass, even as the thread may pierce the diamond-perforated gem.
I sing a race, unstained from birth, successful in each bold emprize,
Victorious even to Ocean's bounds, and borne on cars to heaven on high;
The sacred fire they duly kept; no suppliant craved their grace in vain;
Fit vengeance on the guilty fell; all watchful they in doubtful hour;
'Twas but to give, they gathered; still, their measured words to truth were given;
Victory they sought for glory's sake; for offspring the connubial tie.
Learning in childhood; next in youth, each worldly task and joy were theirs;
Hermits in age; from bodily chains freed by devotion's power at last.
Even such was Raghu 's lofty line; even such the poet's mighty theme,—
For why? their storied high renown impels me to the fond attempt.
Then be it heard, heard by the wise, 'twixt good and bad discerning well,
Even as the quality of gold is tried in the refining fire.

Vaivasvat, of the Manus seventh,—high-honoured by the wise was he,
The mightiest far of earthly kings, like Om the mightiest word of power.
Pure was his race; purest of all, Dilíp beheld the light of day,
Who shone the first of kings, as shines the moon within the milky sea.
Broad-breasted, shoulders like a bull's, like Shála boughs his long arms reached;
As in its own peculiar seat, the Kshatri virtue in him dwelt.
With all-surpassing force endowed, with peerless splendour was he graced,
Towering o'er all on earth he strode, as Meru o'er the mountains towers.
Nor less his wisdom than his force, with aims that wisdom to beseem,
And bold his efforts as his aims, and like his efforts his success.
Stern and yet mild the monarch's mood, he stood before his subjects' eye,
Dreaded yet loved, like Ocean's depths at once with pearls and monsters filled.
And not one hair's breadth from the path, the path prescribed, of holiness,
His subjects swerved; his chariot tracks with vigilant eye they followed still.
'Twas for his people's good alone his royal revenues were ta'en,
As the sun drinks earth's moisture up to pour it back a thousand fold.
With care his martial force he kept; by twofold means his power preserved,

* Literally *word* and *meaning*. † The well known *Su'rya-Vans'a*.

A mind much versed in holy books, and his good bow aye ready bent.
Secret of purpose, self-possessed,—his thoughts ye gathered doubtfully,
Till from the issue forth they shone, like quickening memories of the past.
Him, bold in danger's darkest hour, unwearied in each noble deed,
'Midst all his wealth no avarice swayed, nor pleasure 'mid his bliss enslaved.
Modest, though wise; though powerful, mild; liberal, yet careless of display;
Like a rich garland round him wreathed, his native virtues graced the king.
Unhurt by pleasure's deadly power, with large capacious mind endowed,
He saw his years steal on apace, yet vigorous was he as of old.
He trained, protected, nourished all; his people's father he in truth,—
Their natural parents gave them birth, all other duties he performed.
Chastising guilt for order's sake, for offspring seeking marriage ties,
His *labour* and *enjoyment* too became *religion*, righteousness.*
Earth's best he gave in sacrifice,—Heaven's best poured Indra back again,
And thus by mutual interchange, the two sustained the twofold world.
Unmatched the peace in other lands that flourished in his happy realm,
No robber's daring deed was known,—'twas heard of as an ancient tale.
Virtue he honoured in a foe, (like medicine by the sick man prized,)
Cast off the vicious tho' a friend, (even as ye would a poisoned limb.)
Such was he,—sure, combined in him were all the mighty elements,
For every faculty was bent on every side to scatter bliss.
Earth, girdled by its sandy shore and circled by its ocean fosse,
He swayed alone, and calmly swayed, as it had been a single town.
Sprung of the line of Magadha, Sudakshiná his royal spouse,†
(So from her gentle nature called) was sweet as holy gifts are sweet.
Many within his palace walls the lovely dames that owned him lord,
But Lakshmí ‡ and this fair alone his heart's devotion full received.
Much longed of Sudakshiná to see another self produced,
And still he wished, but vainly wished, for long delay had baulked his hope:
Until at last he went to prove the utmost power of holy rites,
The burden of his state-affairs resigning to his counsellors.

§ First the sacred rites they rendered, then the pious king and queen
Sought the sage Vas'ishta's dwelling, by desire of offspring led.
Seemed they, on the car ascending, (deep and pleasant was its sound,)
Like the lightning and Airávat‖ on the murky thunder-cloud.
Lest the holy sage be burdened, small the retinue they chose,

* There seems a reference here to the Bra'hmanical opinion of the four grand objects of human pursuit; *religion, power, enjoyment, final emancipation.* The king's pursuit of enjoyment was as good as the pursuit of religion.

† There is here a play on the words, a thing pretty frequent in this poem. "*Sudakshiná*' was as pleasing as the *dakshina*'."

‡ Lakshmi' seems here to mean the Goddess Lakshmi', the *wife* of Vishnu, the goddess of prosperity.

§ The measure in the translation here changes to Trochaic. It differs from the former by the omission simply of one syllabel at the commencement. It is a livelier measure than the former. The measure in the original is the same as before.

‖ The elephant of Indra.

Yet their native port majestic looked a guard around them placed:
O'er them played the blissful breezes, breathing Shála odours round,
Fell the fragrant flow'r-dust o'er them, danced the rows of forest trees:
Pleased they heard the peacocks' voices shrill resounding on the way,
Still, as rolled the sounding chariot, lifting up their heads to gaze:
Stedfast on the chariot looking pairs of antelopes they saw,
In whose large and glassy eyeballs mirrored they themselves appeared:
In a line the cranes were flying, gently murmuring, overhead,
Like an arch* enwreathed with garlands, baseless, hanging in the sky:
Softly swept the breezes with them, ominous of good success,
Nor was face nor raiment blemished by the dust the steeds upraised:
Sweet the fragrance of the lotus, sweet as their own breath was sweet,
Wafted from the lakelet's bosom, where the cooling ripples ran:
Offerings they received and blessings in the towns themselves had reared,
Where the sacrificial column shewed the recent holy rite:
Each with present of fresh butter crowded the old herdsmen near,
Whom the royal pair would question of the forest trees around: —
Theirs was beauty, theirs was splendour, moving onwards clothed in white,
Like the moon with Chitrá beaming in a pure and cloudless heaven:
This and that the gracious monarch, smiling, shewed his loving spouse,
Nothing recked he of the journey long protracted though it was;
Till at last, with jaded horses, at the holy hermitage
Of the Rishi, in the evening, late arrived the royal pair.
From the forest depths returned and moving near the dazzling fire,
Holy hermits there were bringing wood and fruit and kus'a grass;
Round the entrance deer were couching, fed on rice with nicest care,
Seemed they like the Rishi's children, fearless crowding by the gate:
Here the sages' gentle daughters, watering quickly left the trees,
Lest they scare the timid warblers from the little water-pools:
Now the blaze of day was over,—and the ruminating deer,
Where the ground with rice was sprinkled, lay at ease around the cell.
By the sacred offering's odour, and the smoke the breeze conveyed
From the holy fire there blazing, they were purified anon;—
"Stop the car" exclaimed the monarch, and then, turning to his spouse,
Gently helped her in descending, then himself alighted down.
Lowly did the meek ascetics in obeisance faithful bend
To the monarch great and gracious and to her his partner dear.
When the evening rites were ended, they beheld the mighty sage,
With Arandhatí† there shining, like the Fire-god with his spouse:
Reverently the mighty monarch and his queen their feet did grasp,
While with accents kind and courteous greeted them the holy pair.
Soon each hospitable office banished all the journey's pain,
Then the sage the sage-like monarch questioned on his kingdom's weal;
He the all-victorious hero, graced with matchless eloquence,

* तोरण The head of a gateway, perhaps whether arched or not.
† *Spica Virginis.* ‡ His wife.

Pitly answered thus the question of the reverend awful sage :—
" * Since thou divine and human harm alike dost ward off skilfully,
" Success and all prosperity in every point my kingdom bless ;
" Resistless are thy sacred spells, they quell all enemies afar ;
" Superfluous lie my arrows by,—my darts that never missed the mark.
" Thou throw'st the offering in the fire, a sacrifice of solemn pomp,—
" 'Tis turned into a shower of grain, that banishes all want and fear :
" Safe and unharmed my people live the utmost term of human life,
" Thy holy merits are the cause, 'tis thou procur'st our happiness.
" O sage of heavenly lineage born, while thou remain'st my steady friend,
" Joy linked with joy must flow to me, and blessing heaped on blessing crown.
" Yet what is Earth to me with all its lovely isles, its precious gems,
" When never from thy daughter here a child—another self—has sprung?
" The Manes of my fathers see the S'ráddha's offering must expire ;
" Scarce can they now partake, but turn in sorrow from the sacred cake.
" And all the holy water too, which I have poured, must cease to flow ;
" Foreseeing this, they drink it now all tepid by their woeful sighs.
" Thus purged in soul by holy rites, yet darkened by a failing line,
" Splendid yet wrapped in gloom am I, like Lokálokat the far mount.
" The righteousness of holy deeds is blessedness in worlds to come,
" But double bliss ('tis here and there) springs from a spotless progeny.
" Thus thou behold'st me desolate, and mourn'st thou not, O holy man?
" Fast by thy door a cherished plant is barren all and sapless found.
" This greatest, crushing, load of grief, O mighty sage, I cannot bear ;
" Like a bound elephant am I, vain-struggling the cool stream to reach ;
" And thou must point the path to rest, the mode deliverance to attain,
" Who still in all distress hast proved the saviour of Ikshwáku's line."
The Rishi heard the monarch's words, and wrapped in thought profound
he stood,
With fixed eyes, a moment's space, — so in a pond might fishes sleep.
Through deepest meditation's force his fixed mind beheld the cause
Why failed the mighty monarch's line, and thus the sage addressed the king :—
" 'Twas once, when thou hadst been to pay thy worship to the King of Heaven,
" And back wert speeding, Surabhi‡ beneath the kalpavriksha§ stood.
" To her all worthy of regard thou paid'st not veneration due,
" For eager wert thou pressing home to join thy spouse so well beloved.
" ' Dost thou despise me' ? she exclaimed ; ' be without offspring, till thou
learn'

* The measure in the translation is here Iambic again, and so to the end. In the original it never varies.

† Lokáloka is enlightened on one side, and dark on the other. The account given of it in the Vishnu Purána is as follows :

Beyond the sea of fresh water is a region of twice its extent, where the land is of gold, and where no living beings reside. Thence extends the Loka'loka mountain, which is ten thousand Yojanas (80,000 miles) in breadth, and as many in height ; and beyond it, perpetual darkness invests the mountain all around ; which darkness is again encompassed by the shell of the egg.

Wilson's Vish. Pur. p. 202.

‡ Or Kámadhenu, the cow of plenty, who gratifies all the wishes of her owner.

§ A tree that yields every thing desired.

" ' My offspring to revere ;' even so lighted on thee her withering curse.
" Loud sporting were the elephants amid the Ganga's heavenly stream,
" And nor by thee, O king, the curse, nor by thy charioteer, was heard ;
" Yet 'tis for that impiety that all thy hopes have blasted been, —
" Pay worship wheresoe'er 'tis due, or bid adieu to happiness.
" To yield the offering needed for Varuna's lengthened sacrifice,
" Now deep she dwells in Pátála, whose doors fierce serpents strictly guard ;
" But, monarch, to her offspring here pay withthy spouse the reverence meet ;
" If she shall but propitious prove, she too is Surabhí to thee."
Forth stepped the blameless Nandaní from out the wood while thus he spoke—
The cow whose milk the sage employed to offer holy sacrifice.
Brown was her hue, all beautiful, soft, polished, like the freshest spray ;
Gleamed on her forehead a white mark, as the new moon in twilight gleams.
Whene'er she to her young one turned, her warm milk streamed upon the ground
As from a fount,—'twas holier far than water in the sacrifice.
The dust excited by her hoofs the body of the monarch touched,
And gave a purity as if the king had bathed in holiest spot.
Right joyfully the awful sage beheld the beautiful in form,
And thus addressed his royal guest no longer doomed to blighted hope.
" Know, monarch, thy deliverance comes, I see I see it close at hand,
" Since thus at once, when called by name, bliss-giving Surabhí has come.
" Living on what the woodland yields, her must thou follow step hy step,
" As students science' footsteps track, even so must thou propitiate her ;
" Move onwards, when she moves ; when'er she rests, rest thou beside her there ;
" Recline, when she is pleased to couch ; drink, whensoe'er thou see'st her drink.
" And to the border of the wood, let thy queen also follow her,
" With punctual care, at noon ; and so, still meet her in the even tide.
" Thus shalt thou yield her reverence meet, till she shall all propitious prove,
" Success attend thee ! Be thou first of all who bear a father's name."

" So be it " Humbly, with these words, the prudent monarch with his spouse
Like meek disciple bending low, received his holy master's word.
Then did the holy awful sage, when even's darkening hour arrived,
Dismiss the monarch to repose, whom brighter hopes were cheering now.
All boundless was that sage's power, yet, lest the holy rite be marred,
Thoughtful, he but the simplest means prepared the monarch to receive.
He pointed out a hut of leaves ; soon entered it the king and queen :
And while the sage's pupils there in holy studies passed the night,—
Where kus'a grass bestrewed the floor, full sweetly slept the royal pair.*

* The last three lines correspond to two in the original, the last shloka of which is in a longer measure than the rest of the book. The addition of one or two longer stanzas at the end is frequent. It may be compared to the use of the Alexandrine in English metres.

VI.—*Botany of the Bombay Presidency.*

The following notice, by Sir H. J. Hooker, of the late Mr. Graham's Catalogue of Bombay Plants, extracted from the Journal of Botany for 1841, will interest such of the readers of this Journal as know that work, or who take an interest in Botany or in Agri-Horticultural improvement. Of no part of India is the Botany so little known, as of the Bombay territories; but it is hoped, that an improved and greatly extended catalogue will soon be published by a gentleman well qualified for the task, to whom much of the value of Mr. Graham's work is due.—Ed.

"*A Catalogue of the* Plants *growing in* Bombay and its vicinity, *spontaneous, cultivated, or introduced, as far as they have been ascertained.* By John Graham, Bombay, 1839."

"Besides the late John Graham, Esq. Deputy Post Master General of the Bombay Presidency, whose name stands as the author of this catalogue, Joseph Nimmo, Esq. of Bombay, has been long known as deeply interested in the Botany of Western India, and with both of them we have enjoyed correspondence. The MS. of this work in question was presented to the Agricultural and Horticultural Society of Bombay in 1838, accompanied by the following letter, addressed to James Little, Esq. Secretary to the Society.

"Sir, I beg to present to our Society a list of the vegetable productions of the Bombay Presidency, and to signify my willingness, to see it correctly through the press, should the Society deem it worthy of publication. It has been drawn up with great care, through the assistance of Mr. Nimmo, and not a single plant is put down which has not been seen and examined by one or other of us. I need hardly say that such a list is much wanted by all who pay any attention to the study of botany, and will save much time and trouble in consulting books and figures.

I am &c. &c.

John Graham,

Member of the Agric. and Hortic. Society.

"The Committee of the Society promptly and liberally accepted the offer, and the printing of the catalogue had proceeded under Mr. Graham's superintendence, as far as the 200th page, when death terminated his labours. The remainder has been completed, the preface tells us, under the superintendence of Mr. Nimmo, who has been for many years

a zealous and successful labourer in the same field of science, and who has given the gratifying assurance, that he will coutinue to dedicate his time to the investigation of this hitherto neglected part of India, much of which still remains unexplored, and that he will print supplements to their catalogue from time to time, as additional species and additional information present themselves. Various have been the assistance and contributions received from different sources towards promoting the interests of this volume, but acknowledgements are more especially expressed to Mr. Law of the Civil Service, together with Drs. Lush, Gibson, Murray, and Heddle of the Medical Establishment, with all of whom the author was in constant correspondence and from whom he received very important aid. With regard to Mr. Graham himself, we learn that he was a native of Dumfries-shire, and that he arrived in India in 1828, under the patronage of the late Sir John Malcolm, who was at that time Governor of the Bombay Presidency, and that he was honored with his friendship, and esteem, and resided in his family until he was nominated by him Deputy Post Master General, an appointment he held till the period of his death. He possessed a combination of qualities which peculiarly fitted him for that Office. The performance of his arduous duties, indeed, left him little leisure for the prosecution of his favorite pursuit; but the few and brief opportunities which were afforded him, were eagerly seized and improved; and one of the objects he had most at heart, while Superintendent of the Society's Garden, shortly after its establishment, was to store it with an extensive assortment of rare wild, as well as useful Indian plants, chiefly collected by himself. He expired at Khandalla, the favorite scene of his botanical researches, on the 28th of May, 1839, at the age of 34, after only a few days illness. The intelligence of his decease was received at every station within the Presidency with an almost universal feeling of sorrow and regret, and his friends have testified their admiration of his character, and their grief for his death, by the erection of a handsome monument over his grave.

To Mr. Nimmo, this country, Britain, and the Glasgow Botanic Garden in particular, is indebted for the introduction of several rare and beautiful Indian plants, amongst them the singular *Impatiens Scapiflora* (W. and A.) in the *Botanical Magazine*, tab. 5387, the splendid *Habenaria Gigantea*, (Bot. Mag. t. 3374) the *Habenaria Goodyeroides*, (Bot. Mag. t. 3397.) and many others.

The arrangement of the work under notice is that of De Condolle's *Prodromus,* and the number of species, including *Ferns,* is 1799, exclusive however of several new plants mentioned in the supplements, and some new genera. The book is much more than a catalogue; there are tolerably copious synonyms, references to figures, remarks on the uses, properties, &c. and frequent poetical and classical allusions and characters of the new species. That such a publication in the Presidency itself will tend materially to promote the study of the Botany of the Western side of India, we cannot for a moment doubt; nor that this stimulus will induce many, who have the inclination and the opportunity, to explore the great chain of the Ghauts, (which could not fail to yield an abundant harvest) and much interesting country to the north of Bombay, particularly Guzerat, Cutch, and the great sandy deserts bordering on the Sindy and on Moultan."

VII.—*Ehrenberg on the Formation of the Coral Islands and Coral Banks in the Red Sea.* Concluded from page 136.

Historical Account.

The most ancient accounts of corals being masses of rock, refer to those of the Red Sea, and to the dangers said to be incurred near them on voyages from North Africa to India, which attracted the attention of nations in very remote ages. It is, nevertheless, surprising, that there are no particular accounts of these coral banks even at the present day. It is true Forskal's exertions have thrown some light upon the subject, still he has not given us a complete description of these phenomena. He merely sketched with a few happy strokes the general appearance and the extensive distribution of the corals, * whilst both before and after his time, the animals which form the corals have been treated of with little detail, and without order.

* Descr. animal p. xxix. Montes coralliferi aburbe. Ter usque ad Ghonfadam ripas muniunt submarinas densissime post hanc urbem versus meridiem rariores evadunt (an desinant plane nescio), ita nautae, quantumvis timidi et inexperti jam securis navigent velis nocturno quoque tempore. Suensia littora nesciunt Cotallia.

In Lord Valentia's map of the Red Sea and in other geographical and hydrographical papers, many coral reefs are marked; thus some light is thrown upon their extent, but they require further illustration and should not be confounded with sand-banks. We had many opportunities of ascertaining, that they were often marked in wrong situations and in wrong directions; we found also that their forms were generally given incorrectly. It appears that those who have been there and have given us an account of their voyages, sailed by these cliffs and islands at high water without stopping to examine them, sketching the places pointed out to them by the Pilots without perfectly understanding them. As only a few havens have been accurately examined and are perfectly known, they cannot give a clear idea of the whole. * As the interest excited by the descriptions of the coral islands in the Pacific is now so great, we feel assured that an account of those in the Red Sea will not be unacceptable.

The stay of Dr. Hemprich and myself on those coasts, enables us to give a more perfect description of these banks. We stayed there eighteen months, nine months in 1823 and the beginning of 1824, and the other nine in 1825. We spent nearly twelve months on board a vessel in that sea, sailing almost through the whole of its extent; we saw a great number of islands and coral banks, and touched at forty-eight different points on the coasts for the purpose of examining them accurately. We observed about 150 different islands and places on the coasts, situated in various degrees of latitude, besides those which we examined stretching along the coast of Sinaitic Arabia, nearly 200 miles in length. We also made a collection of the different species of coral animals which we found on the coral banks, nearly the whole of which we presented to the Royal Museum; and which contains 110 different species, consequently nearly 3 times as many as those collected and described by Shaw, Forskål, Savigny and Rüppell together. The knowledge of the formation of corals in the Red Sea, thus gained by labor attended with considerable danger, is, I trust sufficiently accurate, to render the following a just account of the subject.

General description of the extent of Coral Banks in the Red Sea.

The Red Sea if compared with the Mediterranean, Baltic, and North Sea and the Atlantic ocean with their coasts, appears to Europeans to dif-

* The chart of this sea by the officers of the Indian Navy was not published when these observations were written. — *Edit.*

fer from them in having all its shores encircled with flat rocky banks, which just rise to the surface of the water, but are almost always covered with it. They are sometimes found at a great distance from land, and as they are not easily discernible even when very near, vessels are exposed to great danger from them. These banks are always wet even when they rise above the surface of the water and become visible; the Arabs call them Shaebĕ, in the plural Shaebān, to distinguish them from islands which they call Gesīre, in the plural, Gesirāt. With the exception of Suez, Tor and Yambo, there are very few havens in the Red Sea which allow even the Native craft to anchor near the shore, on account of the flat banks of rock which often stretch out a quarter to half a mile, and are covered with little water, or are quite dry at low ebb; it happens frequently that the crew cannot even go on shore in small boats owing to the shallowness of the water, but are obliged to leave the boats a great distance from land, making them fast to rocks and anchors, while they themselves wade a considerable distance through the water to reach the land. When we visited these shores the crew usually carried us, with our arms and luggage, on their backs to the land and back for a mere trifle.

Besides this rocky beach which is evidently connected with the mainland, upon which there are occasional hills formed by the sand drifted from the shore, there are other flat rocks scattered at small distances in the sea; these being rather lower than the rocky beach, are covered with water, and between it and them, there are channels containing one, and sometimes two fathoms of water, formed by the waves which break over them; here small vessels may safely anchor. These rocks which rise from the bottom of the sea are covered with corals, they form indeed the coral banks of the Red Sea; they are sometimes found in one unbroken chain near the coast, sometimes they run in parallel lines into the sea. In the most violent storms, vessels which are on the leeside of these coral banks may be considered out of danger, as they may be secured in various manners with iron hooks, chains, ropes and anchors. These reefs are sometimes very long, and vessels which are driven by violent winds and sometimes by currents so near them that the rudder and sails are rendered useless by the force of breakers, are inevitably lost, the rising surf throwing them against the rocks and thus dashing them to pieces. I shudder when I remember the danger to which I was personally exposed when our ship was sailing from Suez to Jedda; we were driven in broad daylight on

one of these small reefs near Wush, notwithstanding the continued exertions of the crew; three shocks which the vessel received by three waves carrying us over the bank, made us every moment expect certain destruction. Happily there was sufficient water on the reef to bear the vessel, so that the fourth wave carried us again into the deep water where we were kept in dreadful suspense for three hours, until it was ascertained that the vessel was merely shaken but not broken. Sheikh Imam Abdallah, a man with snow-white hair, who was on a pilgrimage to Mecca received in solemn silence the blessings and the tears of gratitude of 50 persons, who ascribed their deliverance to his presence.

These reefs are most numerous on the Arabian coast, half way down the Red Sea. From Tor in the Bay of Suez down to Camfuda in Arabia Felix, all we saw were of the same form; but this formation of coral banks becomes more rare both in the north part of the Red Sea from Tor to Suez, and in the south part from Camfuda to Mocha; in the south we saw only one of this description a little north from Nakuhs. This the Arabs affirm to be the last; they call it therefore Shaeb-el-Chassa. We could not ascertain for ourselves that there were, indeed, so few coral banks in the southern part of the Red Sea, but the seafaring men told us that they could sail day and night both from Suez to Tor, and from Camfuda to Mocha, while no Arab vessel which keeps the coast in view, ventures to sail by night in the whole middle part from Tor to Camfuda. As sudden storms frequently rise and there are but few secure places for casting anchor, broad daylight is required in order to put in to any port.

The depth of the middle part of the Red Sea is so great that an anchor cannot be cast there, and this causes such tremendous waves to rise on a stormy day, that no vessel without a deck can resist them. I do not recollect to have seen such a rough sea and such high waves in any other sea with which I am personally acquainted, and which are the Mediterranean, the Adriatic, the North Sea, the Baltic and the Caspian Sea near Astrachan, although I have had many stormy days on the four first mentioned seas, and make full allowance for the small size of the vessels used by me on the Red Sea.

The highest waves I have ever seen, I found in the deep sea between Sherm-el-Sheik, the isle of Tiran and Ras Mohammed at the entrance of the bay of Akaba, where also according to seafaring men no bottom is found at a depth of 100 fathoms. We did not meet with such

high waves in the southern part of the Red Sea, although on my return from Abyssinia I had to endure a severe storm for three days.

I had also sufficient opportunity of ascertaining that there is no want of coral banks in those regions, for when we crossed the sea from the Arabian isle Camaran to Dhalac, we met with coral banks near every island and with several detached coral rocks, nearly the whole of which were covered with water, and consequently would be reckoned amongst the most dangerous in the Red Sea if they were situated in the track of vessels. I am therefore of opinion, that the inconsiderable depth of the sea * and the want of high waves rather than the want of coral rocks are the causes, why seafaring men sail with greater security in Yemen. In this general description of the coral banks of the Red Sea, I cannot omit noticing that in the middle and deepest part of this large sheet of water from Djedda in Arabia to Cosseir in Africa, not a single coral bank is to be found. On my return from Yemen to Cossier I was on board the large Egyptian Brig El-Kandil, which, on account of its having a deck and being commanded by a Grecian Captain, sailed on the high sea out of sight of land. Contrary winds obliged us to tack for twelve days and nights, notwithstanding this, we did not meet with a single coral reef on this voyage, the captain steered the vessel towards evening in the direction of the Arabian coast, and during the night he sailed into the high sea in the direction of the African coast. The only rocks which we saw in the high sea was in the latitude of Cosseir itself; it was the isle Fennatir, consisting of two rocks; northward of this island more isles and rocks gradually make their appearance which allow the entrance of native vessels into the bay of Suez only at day-light. In a similar manner do the islands of Tiran and Barkan with other neighboring coral reefs block up the entrance into the bay of Akaba; Fennatir however is no coral bank but consists of two small rocks rising above the surface of the water.

If you look at the shores of the Arabian sea and compare with them the coral rocks and isles of the same, you will find that where the water is shallow, there coral banks and isles abound, but that not a single coral reef rises out of deep water. They are therefore in greater abundance in the neighborhood of flat shores, or where it is apparent volcanoes have

* Don Juam de Castro in 1540 found the depth of the middle of this southern part only 10 to 11 fathoms. Hist: Gen. des. Voyages I. 174; also Lord Valentia in 1804.

produced risings and fillings up of the bottom of the sea. The Arabian seamen of Tor told us expressly, that the bay of Suez, in the southern part of which there are many large coral banks at some distance from the shore, is no where very deep, as they have had occasion to ascertain by casting anchors, and more frequently by fishing with angles. According to their account, the greatest depth of the bay of Suez in the middle part, does not exceed 50 fathoms; it is often much less, only 20 to 12 fathoms; farther towards Suez it is only 10, and gradually near the city from 2 fathoms down to 1 fathom. South of Ras Mahammed a log line of 100 fathoms deep did not reach the bottom, and deeper measurements were not tried. The greatest depth in the large basin or bay of the Pharaoh's sea, Birket Firawn, which I myself have measured with a line of 50 fathoms, amounted to 45 fathoms. It is true, from the appearance of Naphtha near Gebel Setic (mountain of Olives) on the African coast, (I have seen such Naphtha in Tor and observed the rocks of Gebel Setic at a distance) which is in the same latitude as the numerons coral banks of the bay, the hot wells near Hamam Firawn, and the warm wells near Tor as also the mountainous region abounding with black rock, which Burkhardt says he saw near Ras Mahammed, but which we did not find, we have reason to conclude that there have been volcanoes, and may still be in the neighborhood. It is probable that the reason of there being many more small islands and rocks scattered along the coast of Arabia than on that of Africa, is that the whole of the coast is of a more volcanic nature. That this is the case was an opinion entertained by Leopold Van Buch; and is mentioned at the end of his celebrated work on the Canary islands, inferred from the works of former travellers, and which I had occasion to place beyond a doubt in a lecture which I delivered at Berlin in the year 1827, *On the character of the Libyan Desert*, by adding facts observed by myself to what was already known. It is true that the whole Arabian Peninsula presents evidence of former volcanic eruptions which may have produced it wholly, or altered its shape, while none of these signs have as yet been observed on the African coast from Cosseir down to Massava, although it has been frequently visited by travellers both by land and water. It is therefore, probable, that the latter coast has fewer coral reefs, and what I saw in the neighborhood of Cosseir, confirms this supposition. In the southern part of the Red Sea there is at the present time a focus of volcanic activity called Sebahn or Gebel Taer (mountain of

'birds, mountain of the monastery). Many small coral reef islands are also found in the midst of the sea, the depth of which is not great. From the middle part of the Red Sea to Cosseir there being no volcanoes, the water is very deep and quite free from islands and coral banks. The coast near Suez has no coral reefs and is level.

On the formation and peculiar shape of the Coral Banks of the Red Sea.

All coral banks in the Red Sea have something characteristic. Their tops are flat and run parallel with the surface of the water. They never form indented cliffs above the level of the sea. Their tops lie from between $\frac{1}{2}$ to 2 fathoms below the surface of the water, and at low water one or more small points appear which with every fresh wind are covered by waves. These points are but small loose masses of rock of a darkish color; they are never corals but always fragments of a very hard limestone with a slaty fracture. They often appear to be beacons planted there on purpose, and often may be used as such; but we had opportunity to ascertain that the greater part of them were no artificial beacons, there being numerous similar points close by. The greater part of all such coral reefs, of which a few stones only rise above the sea, is a few feet below the surface of the water. We never saw local elevations of the height of a couple of fathoms; we never met with any thing like raised mountains except they were islands containing no corals whatever. I never could find any fragments of coral on the surface of all the many flat and elevated islands visited by me, neither could I see any meadows or fields of dead but well preserved coral animals, as Forster, Vancouver and Peron found in the South Sea, and which the latter ventured to describe not as a volcanic product but as a production of the receding sea.

The shape of the coral banks in the Red Sea is not circular with a lake in the middle, as it has been observed in the South Sea. The peculiarity of Australian reefs which was first noticed by Flinders, namely that the part exposed to the high sea and the breakers is always higher than that to the leeward, cannot be applied to the coral reefs of the Red Sea. It is true the sides of all coral banks are irregularly indented; but we found them almost always in straight lines; we never saw one side of them very remarkably elevated, although in the Red Sea too there is a certain regu-

larity in the winds, and the north winds are decidedly the most prevalent there. We never saw the outer edge of the reefs elevated even when exclusively exposed to breakers and stormy waves; on the contrary I have often found this outer edge sloping and gradually deepening. This is partly the case with the coral bank which forms the haven of Tor.

The characteristic form of the coral banks of the Red Sea is rather long, fringe-like, and tabular. Generally speaking these coral banks form the edge of the coast, but they are also found in numbers at a distance of several miles from the shore, rising out of the high sea; still as many as we closely examined, seemed to run parallel with the coast, and thus appeared to be connected with it at their basis. I do not remember to have seen a single reef among the number of those examined by us which runs at a right angle with the coast; it is true we met with some whose banks differed little in length and breadth, but also these sometimes show their affinity with those of a fringe-like form, as they are placed together in rows and form, one fringe often broken but still retaining on the whole the same character as the others.

The Arabian coral banks besides their being flat, long and running parallel with the coast, have this peculiarity, that the water is extremely deep on the side towards the open sea, so that the depth of the sea sometimes exceeds a hundred fathoms. The coral banks forming the immediate edge of the coast so as to be united with the shore, have of course but one fall towards the sea, which usually is very deep close to the edge. The rocks which rise from the open sea have on account of their long and narrow shape, properly speaking, only two declivities, one towards the coast, the other towards the open sea. The declivity of the broad flat coral reef is often gradually sloping. The sea towards the shore is generally not very deep, so that larger vessels avoid as much as possible to sail between the reefs and the shore. However, middle sized vessels and small craft prefer sailing between the coral reefs, as the sea being less agitated, permits them often for many miles to make the best of every favorable breeze, and in case a storm should arise, havens are close at hand. On the other hand, they lose also in speed as they have to follow the windings of the coast, and in case of a contrary wind they can make but little progress by tacking. The depth of the water on the outer edge of the reefs is, generally, the greater the more distant these are from the shore, and sometimes even close to it, the bottom cannot be fathomed.

During a stay of seven months at Tor, I became well acquainted with the fisherman Maallem Ansaree, (Master Ansaree,) a very respectable and experienced old man, who was afterwards created presbyter of the little place. He has an excellent fishing apparatus, and I induced him to measure the bottom of the sea a second time. At some of his experiments I myself was present in his boat. The flat top of the coral reef which forms the haven of Tor is longer than broad, and is covered in the winter at low water with four feet and at high water with eight feet, but in summer at low water often with eight feet and at high water with twelve feet of water. It is obvious that the bottom is formed by a rock running from the northern end of the Bay in a southerly direction, because on that spot near the fort a modern limestone (*Tertiary*) is found which also forms the edge of the coral bank. The haven or the sea within the reef towards the land, has in its greatest depth eight to nine fathoms of water. The reef is about three times as long as wide, has a gradual and no rapid fall towards the land, but its declivity towards the sea is generally very abrupt, and at a short distance the water is 50 fathoms deep. The reef falls in an oblique direction towards the shore, but there is no ridge on the side towards the sea, but above down to the middle there is a flat tabular plain, and although on the side towards the sea the depth of the water increases rapidly, still its declivity is not perpendicular. Near the southern point of the reef there is a heap of loose stones and fragments of coral, which rises above the surface of the water and serves instead of an artificial beacon.

Of the influence of Geological relations upon the Isles and Coral Banks of the Red Sea.

Wherever in modern times, a strict examination has been instituted, there it has been found, that the most intimate connection existed between the islands and the coral reefs, and this we found to be the case in the Red Sea. The whole of the coral reefs examined by ourselves, without one exception, owe their peculiar shape, not merely to the small petrifying animals which we call corals, but more particularly to the geological conditions of the coast and the bottom of the sea. We noticed every where, except where sand, corals and depth of water rendered all observation impossible, that the basis of all risings from the bottom of the sea, which, when islands were covered with sand, or when coral banks

with corals, consisted either of a volcanic product or of a very hard, and sometimes a soft porous limestone, which was evidently formed from cemented fragments of small animals, but whose special ingredients it was impossible to determine. It was evident that these rocks had no direct connection with the shells and corals which lived upon them.

I describe first the islands of volcanic rock. We touched only at two islands which were evidently called into existence by volcanic activity, namely at the Arabian island Ketumbul in the southern part of the Red Sea, between Camfuda and Gisan. The whole is one indented conic rock, consisting of lava which is partly decayed, and appears to have formed the northern edge of a submarine crater which has long been extinguished. The other island we visited was the Abyssinian island Huakel, which is situated still more to the south and contains mountains. I examined them only on the north-west side; they consisted of rock something like burnt jasper without lava or basalt. From both I have brought specimens of rock. Ketumbul rises about 300 feet, and Huakel 150, from the level of the sea. Both are encircled by corals which do not appear to participate in the peculiarities of these islands. From a distance we noticed the volcanic island Gebel Taer or Sebahn, which is a mountain of inconsiderable height (only about 150 feet) without any distinguishing mark. Its centre rises in a peak sloping gradually on the west and north side. There are no other volcanic islands in the Red Sea, nearly the whole extent of which we have examined.

The more lofty islands were formed of a very white limestone or lime-tuff, which we found sometimes hard and somtimes porous, or of a tertiary sandstone; the former sometimes in strata as upon the islands Barkan and Sanafer in the north, and Cameran, Belhosse, Dhalac, Massava and Farsan in the south of the Red Sea. Tiran the largest of these islands is situated at the entrance of the bay of Akaba, and consists of a singular and fantastic rock. The greatest mountain on the island is barren and very perpendicular towards the sea, rising about 800 feet. It contains a field of gypsum, covered with a coating of gypsum like Bergmehl,* which is found sometimes in very large masses, and sometimes in the form of a cracked and very soft crust, which gives no firm footing but crumbles into white powder. On the side towards the shore it is accessi-

* Mountain Meal.

ble and not very perpendicular. I managed to climb it as far as the middle, but on account of the rock being so soft I found it a difficult and rather dangerous task. The lower part of it is a conglomerate of sandstone, and on the east side there are very hard rocks of a tertiary compact limestone.

Respecting the numerous small and flat islands which scarcely appear above the surface of the sea, and which seem so very much like the coral banks, we found that many of those which we visited had a foundation of a very hard rock, which is almost constantly under water, while the upper parts of the islands were more or less elevated sand hills. We noticed this especially at Reman at the entrance of the bay of Akaba, at Samák north-west of Cumfuda, at Ras Kafil at the same place, at Ormuk and Badie between Loheie and Cameran, and at Sheik Said near Massava. On other islands these rocky places became visible and nearly dry at ebb tide. There is an almost innumerable multitude of similar islands on the Arabian Coast. Many of them we closely inspected; they vary so little in their nature from those we above described, that we did not think it worth the time, the trouble, and the danger always connected with it, to subject them to a particular examination.

I proceed to describe the shape of a few islands. It is for the most part roundish, and they rarely possess creeks; they generally extend in straight lines which meet at angles (forming tongues of land) or they have undulatory outlines, but others are longish; still we did not find the more elevated parts running in a paralellism with the coast, but, as is the case with the double island Hassani and Libbehn, they separate from the coast in right angles, while the submarine rocks which accompany the islands run in an opposite direction. The two groups of islands Farsan and Dhalac, appeared to me remarkable; they lie opposite each other and almost in the same latitude in the southern part of the Red Sea, but they are low and probably consist of a number of small islands round a larger, without the least vestige of volcanic rock. Again there are three islands which have a semicircular or horse shoe-like shape, caused by deep inlets. Sanafer at the entrance of the bay of Akaba and Badie not far from Cameran in the south, together with Havakel on the Abyssinian coast appear to be the only ones which approach the shape of a ring. Perhaps the lava island Ketumbul may be counted among them, if a few small rocks which are in the neighborhood are taken into the landscape. The

two last mentioned islands evidently contain volcanic rocks, and we therefore need not wonder at their kettle like shape, which rather confirms the opinion that they have been formed by volcanoes; but with regard to the islands of Sanafer and Badie, this shape alone certainly does not authorise us to infer that they owe their existence to similar causes. They do not contain the least trace of volcanic rock, although Badie on account of the small quantity of land, has a remarkable shape not very unlike that of a ring. I walked all over it and saw in some places, at ebb tide, the flat limestone which is here so generally met with, but no other mineral; the plain which is raised and convex, is covered with driftsand and fragments of the same decayed limestone. Sanafer has only one deep bay running from south to north, and the limestone rocks are more lofty and are divided into two groups with gradual declivities of decayed rock, without any other characteristic. If the number of circular islands in the Pacific were not greater, it is not likely that travellers would have been struck with the shape, and laid it down as a rule for the formation of islands and coral banks, and if their volcanic character were not evident, modern travellers would not have expressed themselves so decidedly in favor of it, as a different opinion was then generally prevailing.

The limestone of the flat and small islands which are often encircled by a comparatively very broad margin of submarine corals, differs not from that of the more lofty islands. It is often evidently nothing but cemented and hardened sand. The colour of this mineral under water, or a little above it, was generally ash-grey or blackish, but on all the somewhat higher islands, or even on those which were only a few feet above the surface of the water, the colour was brilliant, white and chalky. Sometimes horizontal stripes were seen in it, which seem to indicate a deposit from the water. I have deposited a specimen of this rock in the king of Prussia's Museum of Minerals. The larger islands Farsan, Dhalac and Cameran, * consist entirely of this rock and a layer of driftsand, with a small quantity of mould. This rock loosened in flat slabs from rocky banks which are quite flooded only at high tide or from submarine coral reefs, which are never free from water, were covered with corals

* This description of Camèran is not very clear or accurate; that island consists of a mass of recent shells of all sizes and of corals cemented into a hard rock, which rests on a red argillaceous limestone with small shells. *Edit.*

but were by no means corals themselves. But these stones were often, even when of a thin flat shape, so hard that nothing could break them but continual and forcible blows of a hammer. But the rocks exposed to air and sun, though in their nature the same and connected with those described above, were generally very soft, or had retained their hardness only in a few places. The water has sometimes washed out these limestone rocks so that they are perforated like a net and have very sharp corners, which together with the dark colour makes them look like lava-stones, though this is not the case. On fracture the white colour is seen, and the fine fragments of shells, &c. clearly show their real nature, but large petrifactions are very rarely found in them.

There is another characteristic connected with the formation of islands in the Red Sea, which is not without influence upon the formation of coral reefs. All islands which stood as firm rocks out of the sea, had no prominent coral banks on the sea side, but however different their geological character was, they were all perpendicular on the sea side, and on the land side there was a flat elevated piece of land annexed to it, around which corals formed a broad margin. This is the case with the island Tiran, which is formed of tertiary rock; this is the case with the lava island Ketumbul; this also is the case with the islands Barkan, Sanafer, Hassani and Belhosse which are formed of "limituff." The flat sandy pieces of land of the former islands runs north-east in the direction of Arabia, but those of Belhosse run south-west in the direction of Africa. This seems to show that the sea, which is comparatively deep in the north-easterly direction has completely washed away the upper part of the island, as far as the rock, which protects, as it were the other flat part of the island to a certain distance. Such appearances should not be regarded as unimportant when the question is about the formation of coral reefs, as they show in a striking manner that their formation may vary considerably. With regard to the accumulation of sand, I could not help comparing these appendixes of the Arabian islands with the sand fields attached to the Abyssinian rocks, which I have described in my pamphlet on the character of the African deserts. Just as in the Abyssinian deserts, the prevailing north wind causes the sand to accumulate in the southern part of the mountainous regions, so is the effect of the waves of the Red Sea, which cause the sand to accumulate behind the island, i. e. turned away from the prevailing breakers, as in the above case from the direc-

tion of the prevailing wind. From this description it is clear that Geology has much to do with the formation of the flat islands, as well as of the coral banks of the Red Sea.

Of the influence of Coral Animals upon the Rocky Banks of the Red Sea.

Stone-forming coral animals cover the surface of all the rocks in the Red Sea beginning at the middle part of the Bay of Suez, but are not found on the sands. The first impression of the traveller is, that these animals have built the whole of these rocks. In the first part of this work I have described the strikingly pleasing effect, which large fields of coral reef have, when seen under favorable circumstances at low water and in a quiet sea; how they appear like meadows covered with flowers, in the midst of which the bark is gliding along, without our knowing indeed which of these flowers to contemplate most, and of which to take a drawing and fix in colours, as the next often seems to be more brilliant than its neighbour; and not rarely the most beautiful are beyond our reach, or it is dangerous to get out, as the edges of the coral may break and you are precipitated into gaping clefts or at least seriously hurt. When disturbed, almost all of them are nothing but a brown, indented, leafed or melon-like limetuff, the examination and contemplation of which is really tiresome, although the individual forms appear so wonderful.

Wherever we examined isolated coral reefs which were always covered with water, we found on their surface, which are flat, and have only holes and clefts here and there, but are upon the whole pretty even, trunks of coral animals and trees of branch corals all alive, mixed together like flowers in the field. Here also some forms always predominated, but never to the exclusion of the rest. In this sheet of coral there was nothing even similar to our heaths or pine forests. There were madrepora, heteropora, millepora, astreœ, favia, caryophyllia, maeandrias, pocillapora, and stephanocora, &c. alike large and plentiful, intermined usually, with giant-shells, pearl-shells, fungia, sea-hedge hogs, fishes and holothuria; and upon those that were dead we found a large number of zoanthinia, actinia, xenia, and halcyonia, with an immense quantity of annuláta and turbellaria. Round the foot of the coral trees there was often a white limestone sand.

Separate branches of corals were usually found so firmly adhering to

achard rock or to other dead corals, that we required hammer and chisel to loosen them under the water; often it was necessary to do this with all our might: on all such excursions we wore bathing-dresses. But occasionally these branches of corals could also be moved and loosened without force, they were growing upon pieces of dead corals which were lying in the sand. I never found more than three generations growing one upon another. I have rarely found fragments of much decayed corals upon which were other fragments of corals, which had grown after them and also decayed, and connected with these a third generation of an entirely different species in full vigor. None of these ever formed high masses, neither do they appear to have been adhering to any rock; and this perhaps has been the reason that former generations have perished. I have never seen masses formed by the gradual growth of different generations one upon another reach a height, which might not be attained by a single branch of the same species without a foundation of any extraneous matter. But almost every where on knocking off branches of coral, I met with that limestone tuff which forms the bases and mountains of most of the islands, and is one of the general formations of the mountains on the earth. I have never observed in the Red Sea, masses of rock, which showed by entire coral branches embedded in them in a perpendicular manner, that the sand washed by the sea between these coral branches had filled up their interstices, in consequence of which these coral branches remained unbroken, only covered with a cement, like petrified trunks of trees or like insects in amber. But yet if this process in nature, which is described to be so grand in the Pacific, is really true, I must have often seen it in the Red Sea.

Nor did I by any means find the outer edge of every coral reef, or the point which had to resist the whole force of the most furious surge, destitute of live corals, but just in these places this animal life was thriving in its most pleasing and grand form. But there were usually no corals to be found in the outer edge of rocky islands, rising perpendicular above the sea from a great depth, the rebounding surge being too furious; whilst high waves generally flow over the coral reef and thus lose all retiring force.

There is no doubt that coral animals contribute to the growth of coral reefs also in the Red Sea; but I am perfectly convinced that this is not done in masses and layers. This growth appears to be rather the

work of the individual animal and his family. The case of these corals is similar to that of dead plants and trees. The former do not actually increase the quantity of mould, nor the latter of decayed wood to the whole height of their bulk so that new generations would grow upon the old ones. A few feet of mould indicate thousands of years and of extinguished generations: just so a few inconsiderable marks would show that hundreds of years had been required to increase the height of coral reefs. Besides I am inclined to believe, that coral animals rather contribute to the protection and preservation of the islands than to their growth.

From accurate observation of individual coral animals, I have come to the conclusion, that every single coral branch is neither an individual animal whose life has a certain central point, nor a common dwelling for a number of animals whose age and decay could bring sudden destruction upon all. In both cases it would be possible that a coral branch should suddenly lose his common life and appear like a dead tree. This is contrary to what I have experienced, and consequently all that has been inferred from it is incorrect. The coral branch forms a whole, bound together by knots according to certain laws, whose parts are a great number of organic individual animals, which cannot separate themselves at will, but are connected together by parts not essential to their individual life. The blossoms of a tree are similar to a coral family in appearance, but in their nature there is a great and marked difference between the inseparate life of the individual blossoms on a tree, and the perfectly separate organic life of the flower-like animals in corals. Every individual animal blossoms in its perfect state, and in the event of a forcible separation can lose all the remaining parts of his family structure, and by the developement of eggs and formation of knots become the author of a new structure. The stem of the plant is an essential part of the blossom, which, if severed from it, would fade and die, and on the other hand the blossoms are not essential parts of the stem, the life of which would not be destroyed in case of their being forcibly separated from it. But the life of coral animals is never destroyed when the stem is broken and separated, and the individual animals can continue to exist and propagate as was proved long ago by the excellent remarks of Cavolini, and as my observations of the anomalous forms wherever the coral branches were broken, have confirmed again and again. This is the reason why it is

almost impossible to destroy live corals when under water, except when they are loose and tossed about by the waves, which injure all the individual animals, either by grinding or violently knocking them against the sand; or except when they are by an extraordinary accident suddenly and completely covered with sand, or left dry by the retreating waters, or are boiled by volcanic heat. These observations and inferences render it probable, that the opinion so frequently entertained that coral animals die in whole generations, in order that other generations may grow upon their ruins, is not according to nature, and therefore I cannot adopt it.

Here I must not omit mentioning a few other things respecting the nature of the coral animals which are by no means unimportant. I noticed upon the coral reefs of the Red Sea immense blocks of living maeandra and fabia. I could not examine them as they were too large to be removed, and as I was several times unsuccessful in my endeavors to knock off a piece under water, although I exerted myself to the utmost, and called in the assistance of the natives. I could easily believe, that Pharaoh might have seen them, that they were ancient monuments of thousands of years standing, and of generations still more remote; for many of them measured more than a fathom and some $1\frac{1}{2}$ fathoms in diameter, which considering that they are nearly as round as a ball will make them immensely large masses. *

* According to Monsieur de Blainville, (Dict. des Sciences Naturalles, Zoophytes p. 94) Forskal is said to have met with still larger coral blocks namely of 25 cubic-feet, but this is an error. Monsieur de Blainville translates l'on en Sire des blocs, qui ont vingt—cine piedes at qui ne content cependant qu'une piastre caet, but Forskal says pag. 131, Lapides 25 pedem (unum) cubicum aequantes et e littore transvecti (,) emuntur uno piastro reliq.

But it appears that Forster has seen the largest coral blocks. Adalb. de Chamisso mentions p. 187, blocks of coral often one fathom long and from three to four feet thick, but Forster speaks distinctly of coral branches upon Tortoise island, which are dead, and have been raised by volcanoes above the surface of the water, measuring fifteen feet wide. Forster's travel p. 125. Perhaps Heteropora Palmata is sometimes so large. I do not recollect to have seen them larger than nine feet in diameter, and those were Daedalina. Madreporina were only from four to five feet in diameter. Shaw says that he has seen pyramidal Heteropora near Tor, from eight to ten feet high, but I believe that he was deceived by the depth of water: Voyage dans le Levant II. p. 86. These colossal forms of the Daedalina, which are the most interesting of the species, remain frequently quite unnoticed, because it is impossible to get at them for the purpose of examination. I myself believe that I was obliged to leave unnoticed many particular species, perhaps genera, of them.

These coral banks which are undoubtedly very ancient, frequently formed on the outer edge of the coral reefs the uppermost masses, and prove, as it appears to me, that in the whole time which was requisite for their growth, the coral reef had not risen higher, as no succeeding generation of its species has covered them. It is very probable that the original stock continues to live in gigantic *family mansions*; as I at least convinced myself, that in very considerable blocks the inner regularly built and deserted chambers of the more concave stars, as for instance the Astraea dipsacea, reach down as far as the middle of the basis, whilst more flat stars drive themselves between these at acute angles, and thus prove them to be of a later date. I noticed sometimes in such large blocks a few curious hollow places which may have been caused by injuries and the death of individual animals, but sometimes such hollow places were again covered by knots of the next animals and anew called to life.

I am convinced that only this individual aggrandizement of the coral stock, or this extension of family can be called growth of the coral reefs of the Red Sea. The loose structure of the branchy lieteropora, madrepora and millepora cause these species to be less regular and at a certain height they become less productive, especially in the formation of cells, as old trees grow more slowly than young ones. Perhaps the remotest generations of the gigantic Heteropora (madrepora) palmata of the Indian Ocean may be found in a quiet colossal whole, which remained undisturbed for thousands of years.

Farther, in the nature of the coral animals there appears to be something very unfavorable to parasitic forms of their own class. The largest coral stems, however old they may be, are free from all parasites of their own species, although they are often bored and molested by balana and annulata, and sometimes also by bivalve shells. I do not recollect to have seen a single instance where a live coral in the midst of another living coral stem has developed itself; therefore in museums the largest and most beautiful specimens of maeandra, peteropora, pocillopora, &c. may be seen in their perfect state. This unfriendly nature of the coral animals is certainly not a small objection to the opinion, that accumulated generations of them form islands in the Indian Ocean, as nothing of the kind takes place in the Red Sea.

If I express in a few words the general impression, which the observation of the influence of the coral animals upon the formation of islands in the Red Sea has left upon my mind, it is this; that there is not a single

island in a state of growth, but that all are in a state of decay, and that consequently the corals do not promote the growth of the island but serve only as borders and covers to the submarine rock. Thus it appears that the corals do only delay or hinder the total destruction of the islands by waves, but do not produce new ones. To this may be attributed the opinion that coral animals build as high as the surface of the water; for I think that the corals only prevent the islands which are sunk and in a state of decay below the water, from sinking still deeper.

Concerning the formation of the fossil coral strata which are sometimes of an immense size, it is not probable that they are the work of these animals, but merely an aggregation of masses which have decayed after the death of the animals; for no where does such a stratum appear to be a compact, well preserved, coral reef. They are thus formed: The waves wash fragments of coral from the reefs and accumulate them in deep basins until they form thick strata; volcanoes may have raised these strata here and there, as it sometimes happens with shell fragments, and as they have raised whole coral banks of evidently a single layer high above the sea and this in good preservation, as described by Forster and Vancouver.

Historical sketch connected with the growth of Coral Reefs in the Red Sea.

As mention is often made of the growth of coral reefs, and in the Indian Ocean whole Archipelagos and thousands of coral reefs are believed to be built by coral animals, and finished by winds and waves, so also it is true that navigators and the inhabitants of sea ports in the Red Sea, talk of coral reefs growing and havens and straits becoming narrower. My experience respecting this matter is as follows. In Tor, where the south end of the coral reef which forms the haven, was marked by a small heap of stones, I was assured by the old navigator Maallem Ansari, as well as by the oldest man in the small Greek colony, who soon after died, that during their life time, of which the latter who was about 60 years of age, remembered full 50 years, that neither had the signal altered nor the coral reef grown higher, nor had any family tradition to this effect been handed down. I have also turned over the oldest accounts of sea-faring men respecting this very simple port, and found that a description of it given by the Portuguese Don Juan de Castro in the year 1541, coincides so fully with my own observations in the year 1823, that I am inclined to believe that the coral animals have not exercised

any considerable influence in that spot, although a space of nearly 300 years have since elapsed, and every opportunity and accommodation is afforded at Tor to the increase of these animals.

In the same way, the description given at that time of the anchorage of Cosseir which has also nothing peculiar, agrees fully with its form as seen by ourselves at the present time. I also find the description given by de Castro of the three islands near Massava, on the Abyssinian coast, and of the Port of Massava fully applicable to their present form and condition. I will not conceal that when I was at Djedda, the inhabitants of the place bitterly complained of the encroachment made by the corals, which were blocking up the port; also that I found it difficult, because of its complicated form, to compare historical accounts; but at the same time while I do not doubt the fact, I am rather inclined to ascribe it to the encroachment of sand and the inconsiderate throwing over board of ballast which generally consists of coral blocks, and which is constantly done with impunity. The remarks which Forskal makes respecting the increase of land on the Arabian coast and near Suez, agree with the opinion of sand being accumulated. Near Suez there is no doubt that this is the case.

Art. VIII. — *On the occurrence of Quicksilver in the Lava Rocks of Aden.* By J. P. Malcolmson, M. D., Bombay Medical Establishment.

To J. G. Malcolmson, Esq.
Secretary R. A. S. &c., Bombay.

Dear Sir, — I have the pleasure of forwarding to you a specimen of a stone containing quicksilver in its metallic state. The stone was found at Aden about fifteen feet below the surface, about two hundred yards from the beach, by the workmen who were employed in making a road from thence through the centre of the projected new cantonments. You will observe that globules of the metal are deposited on the surface, adhering pretty strongly to what seems a coating of carbonate of lime; this would at first view lead to the conclusion that the mercury had been accidentally lodged there. On further examination with a glass it will, however, be found that small globules are also thickly disseminated in the interior of the stone,—almost every cell containing the metal adhering to its side. This induces me to believe that the mercury is not a foreign deposit, but

has been secreted or separated from the stone, as other metals are supposed to have been. The stone is lava, and a large quantity of a similar description is found in the hills above the town.

It is a subject of some interest to have this specimen fully and minutely examined, it being a very unusual circumstance to find quicksilver in lava or in rocks which are supposed to be of an igneous origin. Its usual habitat being sandstone, slate, sand, &c.

I shall feel much obliged if you will will examine and let me know your opinion regarding the specimen, which is quite at your disposal to use as you think proper.

Believe me to be,
Dear Sir, yours very truly,
JOHN MALCOLMSON, *Asst. Surg.*
Bombay, 24th August, 1843. *Bombay Establishment.*

NOTE BY THE SECRETARY.

The occurrence of native mercury in the volcanic rocks of Aden was first noticed by my friend and namesake Dr. J. P. Malcolmson of the Bombay Army, in an official report, an abstract of which was published in the Bombay Times. A short time after the appearance of this notice, an anonymous correspondent of that paper, stated that the quicksilver had found its way accidentally into the porous stones near the harbour, and that Dr. M. should have been aware of this.

When Dr. M. was in Bombay, he presented, at my request, some specimens of the rock to the Museum of the Asiatic Society, with the above account of the locality from which they were procured. From that statement it does not seem probable that the mercury could have been accidentally introduced; still, as Dr. M. has returned to the spot, he should endeavour to place his interesting discovery beyond the reach of doubt.

The rock certainly does contain a little native mercury, which runs out on its being broken. There are however brilliant metallic looking particles which are nothing more than crystals of glassy felspar; and a white coating in some of the cavities which resembles horn mercury, is perhaps a variety of hyalite.

From the extensive mobility of this metal in its metallic state, there is very little prospect of its being found at Aden in sufficient quantity to justify attempts at working it, even should it be found in a greater quantity than it has yet been.

It does not appear at all improbable, that mercury should be found in a porous volcanic rock such as that of which a great part of the south-western corner of Arabia is composed.

The granites of Peyrot in France are said to be impregnated with native mercury, and in the following extract from a paper read before the Academy of Sciences of Paris on the 12th June last, it will be seen, that M. Leymerie ascribes to a similar source the native mercury discovered in the *detrital* or tertiary clays, resting on the *Jura* limestone of *Larzac*, and also near Montpelier, where it was known to the peasants from the death of trees whose roots penetrate into it.

"Il suffit de se rappeler á cet égard qu'á diverses époques, depuis le dépôt et la consolidation du terrain jurassique qui constitue le Larzac et une partie des Cévennes, la région dont il est question a été soumise á l'influence des actions souterraines, qui ont produit le soulévevement de plusieurs chaînes de montagnes. Dés lors, on concoit sans peine qu'á une de ces époques, des bouffées mercurielles provenant directement des profondeurs du globe, ou que l'on peut encore attribuer á une distillation de gîtes déjá existant dans les terrains anciens qui supportent les couches secondaires du midi, ont pu venir pénétrer la masse préalablement crevassée et fissurée du Larzac, et ensuite s'y condenser. La plus grande partie du métal parvenu á travers les marnes jusque dans les calcaires aura bientôt coulé de fissure en fissure, jusqu'á la premiére couche marneuse qui, dans le plus grand nombre des cas, devait être capable de le retenir. Ensuite, ce mercure sera venu au jour avec une portion de celui contenu dans les marnes elles-mêmes, entre les tranches des couches qui composent le talus occidental du Larzac, où il a pu être poussé en partie, par exemple, par l'eau des cources si vives et si fréquentes le long de la ligne de contact des assises calcaire et marneuse. Quant au mercure signalé à la partie-supèrieure des marnes tertiaires de Montpellier, on peut faire deux hypothèses. Il peut résulter d'une action direte de l'iutérieur à l'extérieur, comme celui du Larzac, et la présence du calomel natif semblerait le faire croire, et alors nous serions conduits à rapporter le phénomène á l'époque du dernier soulèvement des Alpes, lequel a exercé, comme on sait, une certaine influence sur les terrains du S. de la France, où il s'est manifesté, notamment dans les Corbières et dans les Pyrénées, par l'apparition des ophites. On pourrait, en second lieu, supposer que le mercure de Montpellier aurait coulé après coup à une époque assez récente du terrain jurassique des Cévennes dans les sables, et,

par suite, dans la surface des marnes qui forment le sol fondamental de cette ville, et alors on pourrait faire reculer l'introduction des minerais mercuriels dans le Larzac jusqu'à une épopue plus ou moins ancienne. et la rapporter par exemple au soulèvement de la Côte-d'Or, qui s'est fait ressentir d'une manière si prononcée dans le massif jurassique dont il est question".....*L' Institut. 15th June* 1843: Page 196.

JOHN GRANT MALCOLMSON.

ART. — IX. *Note on a Set of Specimens from Aden.* Presented to the Museum. By G. BUIST, LL. D.

These specimens were partly collected by Captain Yeadell of the Artillery, and other officers of the Garrison,—partly by myself in April 1840.

The glassy slag or obsidian is not of frequent occurrence; it appears in veins or streams running down from the summits of the volcanic peaks, like recently indurated lava. Near the cantonments these present fantastic and beautiful appearances, — the torrent of melted matter seeming to have encountered numerous obstructions in its course, and to have been split into a variety of cascades, — just as we see exemplified in cataracts, whose descent is not perpendicular, where the water has encountered breaks and irregularities of surface.

The greater part of the rocks of the Peninsula of Aden are more or less vesicular, presenting an amygdoloidal structure. Calcedony, such as that presented, is of abundant occurrence.

The volcanic ashes were found on the summit of the hill near Steamer Point, about 500 feet above the level of the sea: they were just under the surface, and occasionally mixed with shells. * They bear no resemblance whatever to the driftsand to be seen in abundance at the bottom of the rocks.

Decayed shells such as are herewith sent †, are scattered every where over the hills near Steamer Point, to a height of at least 500 feet: the leisure of a single morning permitted no further examination. I was at first disposed to have believed that they must have been carried there by birds or wild animals for the sake of the Mollusk. The uniformity of their distribution was hostile to this view; and the extreme but perfetly uniform

* These consist of a species of Pupa, a land shell. — *Edit.*

* Murex Inflatus, a common shell on the coast. — *Edit.*

state of decay in which they were found led to the conjecture, that most probably they were elevated from the bottom of the sea, at the time the volcano itself emerged from it. The Peninsula of Aden, it must be recollected, corresponds, in form and magnitude, very closely with a section of one fourth or so of the upper portion of mount Ætna. The Sicilian volcano is 10,000, the Arabian one about 2,000, feet in altitude.

The cone of the former which includes the crater is about 1,100 feet, the interior of the crater about 600, in altitude. Aden as now reached may be regarded as a cone altogether; the circumference of sheet measured along the ridge of the Shum Shum range, is about four miles, that of Ætna very nearly the same.

Considering the length of time Aden has been occupied by our troops, and the abundance of leisure which the officers must enjoy, it is singular that up to this date we should know so little of its natural history. Of its Fauna and Flora, scanty as these are, we literally know nothing; and very little of either its Hydrography, Meteorology, or Geology. A list of questions on these subjects might probably elicit information, which does not seem likely to be spontaneously imparted.

Masses of oyster shells similar to that now sent for exhibition — for I have no duplicate — are strewed in abundance along the beach, some of them of very great magnitude. They appear to have become united while their inhabitants were alive. Masses of cockles are also plentiful; they have obviously been cemented after death by extraneous calcareous matter.

ART. X. — *Note on a Series of Persian Gulf Specimens.* Presented to the Museum. By G. BUIST, LL. D.

The specimens laid before the Society were collected for me, partly by Commodore Brucks I. N. and in part by Mr. Woosnam, Surgeon in the Seasostris Steamer. They are chiefly from the Island of Karrack and the northwestern shores of the Persian Gulf: the precise localities of the greater part of them are unknown to me; but a large tract of coast is said to be composed of the same substances as those on the table.

The salt is not, properly speaking, rock salt, but a mineral found abounding in the crevices and hollows of the rocks where the sea-spray is driven up in high tides or stormy weather, and afterwards evaporated by the sun.*

* This salt is whitish, without the tinge of red so remarkable in rock salt from almost all parts of the world. *Edit.*

The small portion of coral is from the summit of the island of Karrack, which, at the height of 300 or 400 feet above the level of the sea, is said to be entirely composed of this substance. The present specimen appears to be a piece of the ordinary Madropore, which at this moment abounds in these seas. The rocks here seem to be for the most part volcanic. Karrack itself is described, by Dr. Winchester, as composed of coralline sandstone and limestone, plentifully mixed with fossil tubipora. In the limestone are numerous oysters, cockle, limpet and other shells. (Bombay Geographical Transactions, March 1838.) There are no Atolls or Lagoon Islands in the Persian Gulf; and the knowledge of a mass of recent coral, elevated by volcanic agency to such an latitude as the summit of the Island of Karrack, would be a curious addition to the stock of facts collected by Mr. Darwin, on the evidence of alternate subsidence and emergence of rocks in the ocean, furnished by the existence of coral beds, and an important instance of one more of the recent elevations of land in these parts, of which the shores of the Red Sea afford such abundance of examples.

The Selenite is said to be found in thin veins crossing through shells, gravel, and sand, impregnated with saline matter. These statements are given on the authority of gentlemen who have no pretension to Geological knowledge, and are, therefore, to be received with reservation. They are, at the same time, in perfect conformity with appearances presented all along the shores of the Red Sea, especially around the Gulf of Suez. At this last place the appearance of Selenite, such as that now exhibited, invariably indicates the presence of Sodalite, the surface of the ground crisping under the feet like wet soil after a severe frost. In no instance have I found this to fail in the Suez Desert; where the ground was highly saline, sulphate of lime invariably made its appearance in thin veins exfoliating where they cropped out; extending along to the length of from 3 to 20 feet, and seldom penetrating, so far as I could observe, without the means of making any very considerable excavations, more than a few inches into the ground. The veins generally consisted of parallel plates of Selenite, which might be sliced down to any degree of thinness that was desired. On some occasions, but these were of rare occurrence, its structure was fibrous like satin spar, the fibres being nearly transparent and horizontal, at right angles to the axis of the vein.

Art. XI.—*Eclipse of the Sun on the 21st December, 1843; as seen from the Observatory, Colaba.* By Dr. Buist.

In both the Bombay Almanacks for 1843, the time of the commencement of the eclipse is erroneously set down:—the Calendar published at the *Courier* Office gives 7 h. 54 m. as the hour, that of the *Times* 7 h. 26 m., the latter being only a minute wrong. The sun rose bright and fiery at half-past six—the sky was every where cloudless and clear; not a film of mist or streak of vapour, beyond a slight transparent haze being visible down to the edge of the horizon. In making a fresh adjustment of the instrument, an altitude and azimuth circle 18 inches horizontal, and 12 of vertical diameter, the instant of primary contact was lost by a few seconds; it appears from calculation to have occurred at 7 h. 25 m. The appearance at first presented was as if a notch had been struck out from the sun's upper limb: the moon itself, the cause of this, being undistinguishable from the surrounding sky. The defective space was almost absolutely black, sharp, and perfectly well defined; the sky itself was of the deepest tint of blue. As the eclipse proceeded, the moon's disk was faintly illuminated—its figure being discernible, but barely so from the surrounding space. The sun was at no time sufficiently obscured to permit the moon to be examined without the interposition of a shaded glass. No inequality of light was perceptible, nor any spots upon its disk, which was indicated by a faint dimness of appearance barely discernible through a coloured glass. When the eclipse was at its greatest, the visible figure of the sun resembled the moon three days after change, only that its light was infinitely more intense, and its limbs perfectly well defined, without any faintness or irregularity: the cusps were sharp and clear, terminating in the finest points. Professor Henderson* states, in reference to the annular eclipse of the 15th May 1836, that "shortly before the formation of the annulus, the cusps were seen to approach and to be broken into several parts. When they were about 30 or 40 degs. from each other, an arch of faint reddish light was seen extending from the one to the other; this appearance lasted for several sec-

* Astronomical Observations, made at the Royal Observatory, Edinburgh, for the year 1836. Published by order of H. M.'s Government.

onds, when suddenly a small detached portion o the sun's limb like a string of beads, with dark intervals, appeared between them. At the dissolution of the annulus similar appearances were noticed in reverse order."

Though the eclipse of Thursday was scarcely of sufficient magnitude to entitle the observer to feel assured that this phenomenon would present itself, it was looked for with the utmost attention, and from the extreme acuteness and prolongation of the cusps, was at one time expected to have made its appearance. The expectation however was not destined to be realized: the sharp thin line of light bordering the moon at the period of greatest obscuration was unbroken to the end. It is somewhat curious, that in observing the total eclipse of the sun, visible in the South of Europe on the 8th July, 1842, Mr. Bailie, Vice-President of the Astronomical Society, states, that the beads were as distinctly visible as in the annular eclipse seen at Edinburgh in May, 1836—the black string described as generally preceding them not having been apparent;* while Professor Airy, the Astronomer Royal, in observing the same thing, saw from Turin, "nothing whatever of the beads or other irregularity in either of the extremities of the sun's limb. The cusps were perfectly well defined till they met."†

The observations were made by three parties simultaneously—one with a 46-inch achromatic glass by Dolland—a second with a 30-inch glass by Gilbert—and the third with an altitude and azimuth circle of 9-inch radius, and an 18-inch telescope.

Observations were made from 6 till 11 A. M. every ten minutes with the standard barometer, the sympiesometer, Daniel's hygrometer—the wet and dry bulb,—the solar and terrestrial radiation, and standard thermometers, as well as with the actinometer. The table detailing these is subjoined; the barometrical readings are given without correction. The following are the general results: The barometer rose between six and eleven from 30.140 to 30.220, uncorrected for temperature. It reached its greatest altitude of 30.223 at forty minutes past ten, about an hour later than its ordinary average. The amount of its fluctuation was pretty nearly the same as is due to the present period of the year: but its actual altitude is considerably greater than it has been any time

* Report of the Astronomical Society, Nov. to Dec. 1842. Published in *Athenæum*, 7th Jan. 1843; No. 773.

† Ib., 14th Jan., No. 774.

for 20 months past; we have no regular hourly observations anterior to 1st September 1842. It fluctuated considerably betwixt 8 h. 50 m. when it reached a height of 30.202, and 11h. when it stood at 30.220—having fallen to 30.200 at 9—it rose again, and remained at 30.202 for the next three observations. From half-past nine to 20 minutes from ten, when, as already stated, it reached its maximum of 223, it continued to rise steadily and rapidly, and then, in the course of ten minutes, fell 00.003, and continued, as usual at this hour of the day, to descend till afternoon. The sympiesometer, as it generally does, attained its maximum of 30.62 more than an hour before the barometer culminated; like the other, it fluctuated for a time, rising to the same height as that just named at 9 h. 20 m., 10h. 10 m., 10 h. 20 m., and 10 h. 30 m., and sinking back again, being from .61 to .63 at the intermediate periods of 10 min. By the system of observing six times every hour for eight hours a day at the culminating periods of these instruments, presently in practice at the Observatory, it is shewn that there is nothing at all unusual in these phenomena, unless the extreme pressure of the atmosphere observable for nearly a week past, and the unusually late hour at which this on Thursday reached its maximum.

The thermometer which, in the shade, was 67.3 at 6 o'clock, had before 8 o'clock risen to 70; at this it continued stationary till 9 o'clock, when it began to rise steadily as usual, but with somewhat greater rapidity—at 11 it stood at 73.7. Much in this case is dependent on the position of the instrument; another, in a somewhat more airy and elevated position than the standard, sunk by nearly two degrees. A black-bulbed thermometer, exposed to the sun, stood, at 7 o'clock, at 85; by 8 it had risen to 113, when it began rapidly to descend, attaining its minimum of 87.8 at 8 h. 50 m. It pursued, with great exactitude, the course of the eclipse, having, by 10 o'clock, risen to 144, and by 11 to 162; the latter of these is to be received with hesitation, from the too great closeness of the position where the instrument was placed permitting an undue accumulation of heat.

The solar-radiation thermometer pursued a totally different law, having stood at nearly the same point at 6 h. as at 10 h.—20°, *viz.* 62°2′ in the former, and 62° 6′ in the latter case: it had fallen to 58° 1′ at 10, it recovered after 7, but scarcely rallied from that till ¼ from 9. At 11, it had risen to 65° 6′. From 8 to twenty minutes pass 9, the liquid in the actinometer was below zero. The dew point, as indicated by DAN-

NEL'S hygrometer, receded from 65° to 62.5, being found at the latter at 6 h. 11 m., and at the former at 9 h. 40 m. The variation in the dampness of the atmosphere as indicated by this, as well as by the wet and dry-bulb thermometers, being extremely small—the latter instrument varying from 4 to 7 of difference, that is, of actual range; it followed with considerable accuracy the progress of the eclipse.

To the ordinary observer, the most remarkable of all the phenomena presented, was the appearance of the landscape around. The more conspicuous stars had mostly set before sunrise, so that there were no means of knowing whether they might or might not have been seen, if in the sky. Objects, particularly white ones, assumed a bluish-green appearance. The sea, especially towards Malabar Point and the entrance of the Harbour, had a strange melancholy hue,—and a large vessel, a few miles off, looked like a spectre ship. The Cathedral tower, Scottish Church steeple, and Colaba buildings seemed the ghosts of what they were by daylight. The atmosphere was peculiarly still, the land-wind having nearly gone to sleep, and the sea-breeze not having been awakened. The sky was so cool and the sun's rays so feeble, that to be out in the air from 8 to 9 uncovered occasioned no inconvenience. Shadows of objects appeared ill-defined and ragged towards the edges: this altered during the progress of the eclipse, the sides of the shadow towards the South and East being first impaired, that to the South and West becoming afterwards affected. The wind was throughout the day peculiarly faint and unrefreshing.

The amount to which light is diminished even in the case of an entire eclipse, generally occasions disappointment. In the total obscuration in July, 1842, already referred to, it was in no case necessary to use a taper to read with, though stars were seen at Turin and other places in the neighbourhood. Dr. HALLEY observes, in reference to the total eclipse which occurred in 1715—the last which was visible in London—that no one saw more than Capella and Aldebaran of the fixed stars. The rapidity with which the iris of the human eye adjusts itself so as to compensate in a great measure for the withdrawal of light, when this is effected gradually, is such that we are scarcely aware of the amount of loss unless by instrumental observation.

Meteorological Observations during the Eclipse of the Sun, 21st December. 1843.

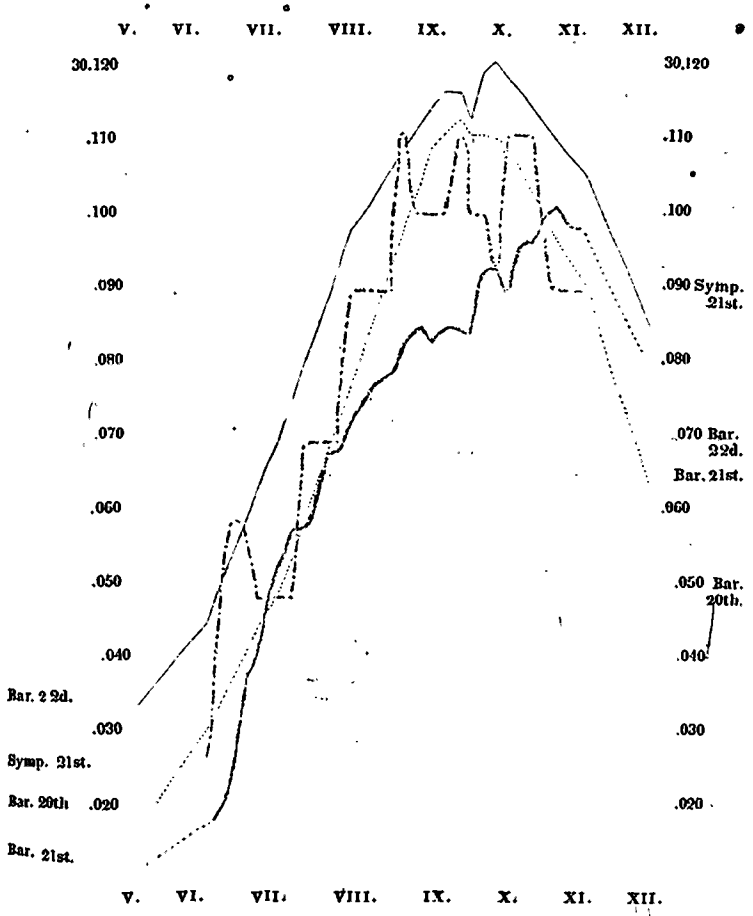
Bombay Mean Time.		Standard Barometer, uncorrected.		Standard Thermm.	Hygrometer.		Difference.	Symplesometer.		Radiation.		Difference.	Daniel's Hygrometer.		Difference.	Actinometer.	Bombay Mean time.	
		Barometer.	Thermometer.		Dry.	Wet.		Sr.	Thr.	Solar.	Terrestrial.		Dew Point.	Air.				
A.	M.		deg.	deg.	deg.	deg.			deg.	deg.	deg.	deg.	deg.	deg.	deg.		A.	M.
6	00	30.140	72.0	69.6	69.0	65.0	4.0	30.54	70.2	74.9	62.2	12.7	65.0	70.5	4.5		6	00
	10	.142	72.0	69.5	69.0	66.0	4.0	.56	70.3	74.4	62.3	12.1	64.0	70.0	6.0			10
	20	.150	71.9	69.3	68.6	64.4	4.2	.57	70.2	71.0	59.3	11.7	64.0	70.0	6.0			20
	30	.156	71.7	69.3	68.8	64.6	4.2	.57	69.9	70.0	58.9	11.1	63.5	70.0	6.5			30
	40	.160	71.6	69.3	68.8	64.6	4.2	.56	69.9	71.0	58.7	12.3	62.6	69.7	7.1			40
	50	.167	71.6	69.3	68.7	64.0	4.7	.56	69.7	77.1	58.2	18.9	61.8	69.9	8.1			50
7	00	.171	71.6	69.3	68.9	64.0	4.9	.56	69.6	85.7	58.2	27.5	62.5	70.0	7.5		7	00
	10	.175	71.6	69.3	68.8	63.8	5.0	.56	69.7	95.1	58.1	37.0	62.0	70.0	8.0	22.31		10
	20	.176	71.5	69.5	69.0	63.5	5.5	.58	69.8	101.7	58.2	43.5	63.0	70.1	7.1	20.02		20
	30	.181	71.5	69.5	69.0	63.9	5.1	.58	69.8	108.6	58.5	50.1	62.5	70.5	8.0	21.88		30
	40	.186	71.6	69.6	69.0	64.0	5.0	.58	69.8	112.4	58.4	54.0	63.2	70.4	7.2	22.61		40
	50	.186	71.6	69.9	69.6	64.1	5.5	.58	70.1	113.2	59.1	54.1	62.9	70.6	7.7	23.71		50
8	00	.190	71.7	70.2	69.6	64.0	5.6	.60	70.3	112.2	59.0	53.2	62.8	70.8	8.0	17.63	8	00
	10	.192	70.5	70.5	69.3	65.0	4.3	.60	70.5	108.7	58.9	49.8	62.7	70.7	8.0	Liquid below Zero.		10
	20	.195	71.6	70.5	70.4	65.0	5.4	.60	70.7	103.6	58.5	45.1	63.0	70.5	7.5	do.		20
	30	.196	71.6	70.5	69.0	65.0	4.0	.60	70.7	96.5	58.1	38.4	63.5	70.6	7.1	do.		30
	40	.200	71.6	70.4	70.0	65.5	4.5	.62	70.5	89.7	58.3	31.4	64.2	70.5	6.3	do.		40
	50	.202	71.5	70.4	70.0	66.0	4.0	.61	70.7	87.7	59.2	28.5	64.4	70.5	6.1	do.		50
9	00	.200	71.5	70.5	70.3	66.1	4.2	.61	70.8	91.2	59.1	32.1	64.9	70.8	7.1	do.	9	00
	10	.202	71.5	70.6	70.5	66.1	4.4	.61	71.0	98.2	60.1	38.1	65.5	71.4	5.9	do.		10
	20	.202	71.7	70.9	70.6	66.0	4.6	.62	71.1	106.8	60.6	46.2	64.0	71.7	7.7	14.84		20
	30	.202	71.8	71.2	71.0	66.0	5.0	.61	71.3	118.2	60.8	57.4	64.2	72.2	8.0	20.95		30
	40	.210	72.0	71.5	71.5	65.0	6.5	.61	71.4	127.5	61.0	66.5	62.5	72.3	9.8	25.50		40
	50	.212	72.2	71.7	72.0	65.9	6.1	.60	71.8	137.5	60.8	76.7	64.1	72.9	8.8	30.11		50
10	00	.210	72.5	72.2	72.4	66.1	6.3	.62	72.0	144.1	61.2	82.9	62.9	73.1	10.2	33.17	10	00
	10	.216	72.6	72.8	72.5	66.3	6.2	.62	72.4	148.4	62.0	86.4	63.6	73.2	9.6	34.56		10
	20	.216	73.0	72.8	73.0	66.1	6.9	.62	72.9	154.7	62.6	92.1	62.8	73.7	10.9	36.80		20
	30	.220	73.0	73.2	73.6	66.1	7.4	.61	73.1	158.2	63.1	95.1	62.0	73.9	11.9	36.63		30
	40	.223	73.5	73.4	74.0	66.5	7.5	.60	73.5	160.2	64.0	96.2	63.0	74.4	11.4	38.81		40
	50	.220	73.5	73.7	74.5	66.6	7.9	.60	73.8	162.2	64.7	97.5	63.7	74.2	11.0	39.26		50
11	00	.220	73.7	74.2	74.9	67.5	7.4	.60	74.2	162.2	65.6	96.6	64.4	74.7	10.3	39.70	11	00

Zenith distance and Azimuth of the Sun and Moon, 21st December, 1843.

Time.	Object.	Zenith distance.	Azimuth from the North.	Hour.	Wind.	Weather.	Remarks.
A. M. H. M. S.				A. M. HS. MS.			
7 24 56	Eclipse begins.	Deg. Min.	Deg. Min.	6 0	E.S.E.	Light Breeze.	Sky Clear.
7 31 55	⊙ Upper Limb.	77 3 E.	120 42 E.	0 10	"		"
7 41 15	⊙ Lower Limb.	75 40 "	"	0 20	"		"
7 44 15	☽ " "	74 43 "	121 02 "	0 30	"	Sun rise at 6h. 31m.	"
7 50 21	⊙ " "	73 52 "	123 30 "	0 40	"		"
7 58 22	☽ " "	72 37 "	123 20 "	0 50	"		"
8 0 29	⊙ " "	71 53 "	123 44 "	7 0	"		"
8 6 3	☽ " "	70 36 "	124 48 "	0 10	"		"
8 10 45	⊙ " "	69 53 "	125 02 "	0 20	"	Sun eclipsed at 7h. 25m.	
8 16 10	⊙ " "	68 51 "	125 45 "	0 30	"		"
8 20 42	☽ " "	67 55 "	126 31 "	0	"		
8 30 34	⊙ " "	66 08 "	127 47 "	0 50	"	Thick mist in the West.	"
				8 0	E.		Sky Clear.
8 41 46	⊙ Upper Limb.	63 31 "	129 13 "	0 10	"		"
8 44 59	☽ " "	63 00 "	130 02 "	0 20	"	Faint sunshine.	"
8 50 25	⊙ " "	61 58 "	131 50 "	0 30	"		"
8 55 50	☽ " "	61 07 "	131 45 "	0 40	"	Middle of the Eclipse at 8h. 40m.	
9 0 50	⊙ " "	60 08 "	132 33 "	0 50	"	Faint sunshine.	"
9 10 25	☽ " "	58 40 "	134 12 "	9 0	"	"	"
9 20 37	⊙ " "	56 47 "	136 10 "	0 10	"	"	"
9 30 2	☽ " "	55 33 "	137 49 "	0 20	"	"	"
9 35 6	⊙ " "	54 29 "	138 52 "	0 30	"	"	"
9 40 10	☽ " "	54 02 "	139 50 "	0 40	"		"
9 45 31	☽ " "	53 15 "	140 58 "	0 50	"		"
9 50 1	☽ " "	52 36 "		10 0	"		"
9 55 24	⊙ " "	51 30 "	143 28 "	0 10	"	Eclipse ends.	"
				0 20	"		"
				0 30	"		"
10 10 41	Eclipse ends.			0 40	"		"
				0 50	"		"
				11 0	"		"

☞ The precise time of the beginning of the Eclipse could not be observed accurately to a second; therefore the time given may be a few seconds out. The end of the Eclipse has been correctly observed to a second.

Magnetic Observatory, Bombay, 21st December, 1843.



On the diagram the curves of the barometer and sympiesometer on the morning of the eclipse, and that of the former instrument on the day before and after, are laid down to thousandths of an inch—the readings being taken for the 21st, six times an hour throughout, and in like fashion from eight to ten on the 20th and 22d. Before and after this, where the movements are represented by straight lines, the readings are only made once an hour. The curves of the 21st present to the eye at once the singular fact formerly referred to—that of the barometer having continued to rise till within 20 minutes of 11 on the morning of the eclipse—that is, for nearly an hour beyond its ordinary time,—the maximum of the sympiesometer as usual preceding that of the barometer by about 50 minutes. On glancing over the observations made at the observatory since the 1st September, 1842, I am unable to discover that, out of 400 days on which the barometer has been read hourly, this ever

occurred before. My study of them has not been sufficiently careful to enable me to speak positively of the fact; but my impression is, that the rise is, within the period specified, unprecedented. It will be interesting to know whether any thing of a similar nature has ever been noticed at other stations similarly circumstanced. In the table the scale readings of all the instruments, save the actinometer, are given without correction—in the diagram the barometer is corrected for temperature: this has very little bearing on the present occasion on the mere form of the curve, as the thermometer only ranged four degrees in all throughout the entire course of the eclipse.

Art. XII.—*Meteorological Observations.*

The Meteorological report given in the previous number of the Journal consisted of a return of twenty-four hours' consecutive observations made on the term days,—the state of the Observatory in respect of the number of assistants then employed not permitting continuous observations such as to supply the average of the month. The term day observations of July and August 1842, were lost in consequence of the sickness of the only assistant who at that period remained attached to the Observatory. Government having subsequently sanctioned the employment of Native assistants in place of two of the Europeans originally employed, the observations have been carried on without interruption from the 1st September 1842 to the present time, and the abstracts now supplied present the means of the hourly observations for the month,—getting rid of casual variations and furnishing the elements of the mean directions of the barometeric curve.

It was stated in the last number of the Journal that the Barometer by which the observations were noted from May to July 1841, was a standard by Adie of Edinburgh, and that its readings were 0.150 higher than the Observatory standard by Newman, subsequently employed, and assumed as correct:—so that, in order to reconcile the observations recorded in the first number of the Journal with those subsequently published up to April 1843 (No. V.,) 0.150 must be substracted from the former or added to the latter. An elaborate series of comparisons with other Barometers made in January 1843, and given at length in the previous part of the number, together with a comparison of the Bombay and Travendrum observations with each other, led to the suspicion that air had been admitted into the tube when the Barometer was originally set

up. The instrument having been taken down and inverted, a bubble was discovered of such magnitude as to elevate the mercury on its re-adjustment 0.100. The tube was not boiled afresh and some slight vesicles still appear to adhere to it; from this circumstance and from the amount of discrepancy still existing between it and the other instruments with which, as already stated, it was compared, the total error appearing to exist in the present return, is .125—They have been given as copied from the Observatory records of scale readings corrected for temperature and capillarity, but it requires the addition of .125 to make them correct. The observations by Adie's instrument given before June 1841, require 0.025 to be substracted from them to render them correct—the instrument referred to is that marked No. VII. in the list of comparative observations. The returns which may be supplied subsequent to the adjustment of the barometer in June 1843, will require a correction of +0.25 only, this will be duly noted on the preface to the tables.

G. Buist.

Magnetic and Meteorological Observatory, Colaba, mean hourly Observations for September, 1843.

Bombay Mean Time.	Barometer. Corrected to 32 Fah.	Stand. Ther.	Thermometer. Dry.	Thermometer. Wet.	Differ-ence.	Remarks.
A. M.		° ′		° ′	° ′	
0.0	29.636	80.6		73.8	6.8	This month is generally all cloudy; the sky being scarcely clear, 1-8th.
1.0	.618	80.6		73.8	6.8	
2.0	.610	80.3		74.3	6.0	
3.0	.603	80.2		73.9	6.3	22d. A squall accompanied with rain and
4.0	.602	80.1		73.7	6.4	lightning at 2h. 45m.
5.0	.607	80.0		73.1	6.9	23d. Another at 5 minutes to one A. M.
6.0	.628	79.5		72.3	7.2	accompanied with rain and distant
7.0	.644	79.4		72.8	6.6	thunder; ceases at 1h. 15m. A. M. light-
8.0	.666	80.6		73.4	7.2	ning continued in vivid flashes until
9.0	.676	81.3		73.5	7.8	10 minutes to 2h. A. M. when all gets
10.0	.676	81.8		73.9	7.9	calm and wind gentle.
11.0	.664	82.3		74.2	8.1	29th. Squall accompanied with rain and
0.0	.648	82.8		74.7	8.1	lightning.
P. M.						
1.0	.626	83.0		74.6	8.4	
2.0	.603	83.3		74.9	8.4	
3.0	.586	83.2		75.8	7.4	
4.0	.582	83.2		76.2	7.0	
5.0	.587	82.5		75.7	6.8	
6.0	.606	81.9		76.0	5.9	
7.0	.620	81.3		76.0	5.3	
8.0	.632	80.4		75.7	4.7	Quantity of rain during the month 9.23.
9.0	.642	80.8		75.2	5.6	
10.0	.649	80.0		74.6	5.4	
11.0	.644	80.6		74.0	6.6	
Mean.	29.626	81.3		74.5	6.8	

Magnetic Observatory, Colaba, mean hourly Observations for October, 1842.

Bombay Mean Time.	Barometer. Corrected to 32 Fah.	Stand. Ther.	Thermometer. Dry.	Thermometer. Wet.	Difference.	Remarks.
A. M.		° ′		° ′	° ′	
0.0	29.733	81.6		77.0	4.6	During all the days of this month the proportion of the cloudy to the clear sky, in its mean state, was not more than 3-8ths.
1.0	.727	81.3		76.8	4.5	
2.0	.720	81.2		76.6	4.6	
3.0	.718	80.9		76.5	4.4	
4.0	.720	80.7		76.3	4.4	31st. The lightning struck the H. C. S. Coote, in Bombay Harbour at 8 minutes past 4 A. M., and shivered her foremast from top to bottom; no lives were lost. The thunder seemed more than an hour nearly overhead.
5.0	.728	80.6		76.2	4.4	
6.0	.739	80.1		75.8	4.3	
7.0	.763	80.2		75.4	4.8	
8.0	.782	81.4		75.6	5.8	
9.0	.791	82.7		76.2	6.5	
10.0	.791	83.9		77.2	6.7	
11.0	.771	84.6		77.8	6.8	Quantity of rain during the month. Inches 1.63.
0.0	.745	85.0		78.1	6.9	
P. M.						
1.0	.725	85.4		78.1	7.3	*General Remarks.*—The troubled appearance of the sky and the depression of the Barometer manifested between the 26th and 31st, corresponding with the setting in of the Coromandel monsoon, which commenced with a violent hurricane on the 24th day when many ships perished. The Barometer had recovered its unaccustomed level before the severe fall of rain and lightning, which occurred on the 31st.
2.0	.703	85.7		78.6	7.1	
3.0	.689	85.8		79.1	6.7	
4.0	.686	85.8		79.1	6.7	
5.0	.695	85.1		78.6	6.5	
6.0	.706	83.8		78.0	5.8	
7.0	.725	83.2		77.8	5.4	
8.0	.741	82.7		77.6	5.1	
9.0	.746	82.5		77.8	4.7	
10.0	.747	82.3		77.6	4.7	
11.0	.743	82.1		77.5	4.6	
Mean.	29.742	82.8		77.4	5.4	

Magnetic Observatory, Colaba, mean hourly Observations for November, 1842.

Bombay Mean Time.	Barometer. Corrected to 32 Fah.	Stand. Ther.	Thermometer. Dry.	Thermometer. Wet.	Difference.	Remarks.
A. M.		° ′		° ′	° ′	
0.0	29.931	80.0		73.8	6.2	During the month, the nights were generally clear, days about 3-8ths cloudy with circo stratus.
1.0	.918	79.8		73.8	6.0	
2.0	.908	79.6		74.2	5.4	
3.0	.902	79.4		73.8	5.6	
4.0	.903	79.1		73.6	5.5	From 16th to 19th, the days were all cloudy and light rain fell.
5.0	.910	79.2		73.0	6.2	
6.0	.924	78.3		72.3	6.0	
7.0	.940	78.4		72.8	5.6	
8.0	.967	80.0		73.3	6.7	
9.0	.986	81.1		73.4	7.7	
10.0	.985	82.3		73.9	8.4	
11.0	.972	83.1		74.1	9.0	Quantity of rain during the month. Inches 0.38.
0.0	.940	83.9		74.8	9.1	
P. M.						
1.0	.916	84.3		74.6	9.7	
2.0	.896	84.7		74.9	9.8	*General Remarks.* In the morning, during the whole of the month, the mean direction of the wind was East by South when it was relieved by the sea breeze from N. W.
3.0	.886	85.1		75.8	9.3	
4.0	.886	84.8		76.1	8.7	
5.0	.894	83.9		75.7	8.2	
6.0	.901	82.4		76.0	6.4	
7.0	.884	82.2		76.0	6.2	
8.0	.939	81.3		75.7	6.1	
9.0	.947	81.2		75.0	6.2	
10.0	.949	80.5		74.5	6.0	
11.0	.940	80.3		74.0	6.3	
Mean.	29.927	81.4		74.4	7.0	

Magnetic Observatory, Colaba, mean hourly Observations made during the month of December, 1842.

Hour.	Barometer. Corrected to 32 Fah.	Thermo.	Wet Thermo.	Difference	Remarks.
A. M.		° ′	° ′	° ′	
0.0	29.839	78.2	71.8	6.4	During this month, the days and nights
1.0	.830	77.7	71.1	6.6	were generally clear, only a few circo
2.0	.821	77.5	72.4	5.1	stratus prevailing.
3.0	.812	77.0	70.7	6.3	The days about the 20th and 25th were
4.0	.814	76.7	70.6	6.1	almost clouded by stratus.
5.0	.821	76.2	70.7	5.5	
6.0	.844	75.4	69.1	6.3	
7.0	.862	75.1	69.1	6.0	
8.0	.889	76.6	69.7	6.9	No rain during the month.
9.0	.888	78.3	70.3	8.0	
10.0	.895	79.5	70.7	8.8	
11.0	.879	80.8	70.5	10.3	
0.0	.851	81.9	70.5	11.4	
P. M.					
1.0	.824	82.5	71.1	11.4	
2.0	.798	83.0	72.4	10.6	
3.0	.787	83.5	73.0	10.5	
4.0	.785	83.5	73.6	9.9	
5.0	.786	82.7	73.6	9.1	
6.0	.812	81.3	73.0	8.3	
7.0	.835	80.6	72.9	7.7	
8.0	.849	80.0	72.8	7.2	
9.0	.861	79.3	71.8	7.5	
10.0	.854	78.5	71.4	7.1	
11.0	.845	78.3	71.6	6.7	
Mean.	29.835	79.3	71.4	7.9	

Art. XIII.—*Extracts from the Proceedings of the Society.*

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society held in the Library rooms on Wednesday the 12th July 1843.

The Hon. G. W. Anderson, President, in the Chair.

A large and beautiful Map of the rivers Jud and Haines in North Eastern Africa, lately partially explored by Lieutenant W. Christopher, I. N. was submitted for the inspection of the members by the President.

The Secretary laid on the table a copy of the fifth number of the Society's Journal, and it was resolved to continue the publication in the same form, as papers were received.

The Secretary then intimated that agreeably to the instructions of the Society, a case of Geological Specimens had been packed and were ready for transmission to the Museum of the Economic Geology of India, and that another case was nearly ready for the Museum of the St. Andrew's Society.

The following donations to the Library were then submitted to the meeting.

1. By Government, Copy of 4th Edition of the Law relating to India and the East India Company By Government.

2. By Do. through the Medical Board, Medical Topography of the Presidency Division of the Madras Army.

3. Do. of the Centre Division of the Madras Army.

4. By Lieutenant E. B. Eastwick, Copy of Easy Lessons in Chinese, by S. W. Williams.

5. By the Right Rev. Dr. Whelan, Copy of a work entitled Aperçu Géneral surl' Egypte, par A. B. Clot-Bey.

6. Vols. 12, 13. and 14 Memoirs of the Royal Astronomical Society of London, from that Society.

7. By the Rev. J. M. Mitchell, in the name of Major T. B. Jervis, A copy of that gentleman's lithographed maps of the Island of Bombay and of the Khanat of Bokhara.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society held in the Library rooms on Wednesday the 9th August, 1843,

The Hon. G. W. Anderson, President, in the Chair.

The following papers were read:—

1. Further remarks on silk cultivation in Kattiawar, by Dr. B. A. R. Nicholson, Civil Surgeon, Rajcote.

Resolved, that, with his permission, Dr. Nicholson's paper be forwarded to the Secretary of the Agri-Horticultural Society, for submission to that Society.

2. *A Letter from Ball Gunghadur Shastree Esq. forwarding an Inscription copied from a stone at Nagpore, with a Balbodh transcription and an English translation, together with remarks to illustrate the Genealogy of the Dynasty to which it refers. This Inscription, which is dated in the Samvat year 1161, or A. D. 1105, was received by L. R. Reid Esq. from Major Wilkinson, Resident at Nagpore.

3. *Observations on the Bactrian and Mithraic Coins in the cabinet of the Bombay Branch of the Royal Asiatic Society, by J. Bird Esq.

This paper was illustrated by a copy and translation of an inscription from the cave temples at Nassick.

4. *A Chart of Observations made on nine different Barometers and one Sympiesometer half hourly, for twenty-four successive hours, with remarks, in reference to the state of the weather at Bombay during the present season, by Geo. Buist, Esq LL. D., in charge of the Magnetic Observatory, Bombay.

5. An Introductory Observation to a metrical translation of the first book of the Raghuvánsá, a heroic poem, by Kalidasa; by the Rev. J. M. Mitchell.

6. *A Note accompanying a series of Geological Specimens from Aden collected by the Author, and Captain Yeadell; by Geo. Buist; Esq. LL. D.

7. *A Note accompanying a series of Geological Specimens collected by Commodore Brucks, in the Persian Gulf, by Geo. Buist, Esq. LL. D.

8. *A Translation from the German of the 3rd part of Ehrenberg's celebrated paper on the coral banks of the Red Sea; by the Rev. C. C. Menge, received through the Rev. G. Pigott.

Read a letter from the Secretary to the Geographical Society, dated 25th July, forwarding a further series of specimens of minerals, rocks, shells, &c. for the Museum, agreeably to the resolution of that body dated 6th May, 1841.

The following books were presented to the Library:—

1. Transactions of the Agri-Horticultural Society of Western India, by the Society.

2. Memoire Sur le lac Moeris, printed at Alexandria, by the Egyptian Society, through Messrs. Frith & Co.

3. Four papers on the mineral resources of Southern India, by Captain Newbold, F. R. S. by the Author.

4. Days in the East, a poem, by Lieutenant J. H. Burke, Bombay Engineers, by the Author.

To the Museum.

A further very valuable collection of minerals and Geological Specimens from Malwa were presented through the Secretary, by the late Lieut. H. M. Blake 7th Regt. N. I.

A collection of rock specimens from Aden, the Persian Gulf, Cabool,

and a few fossils from Lower and Upper Scinde, were presented by Dr. G. Buist.

A series of specimens from Egypt were also laid on the table by Dr. Buist.

The Secretary pointed out the form of a fossil crustacean from Scinde, and of those from Egypt, first taken to Europe by him, which would, with other specimens in his possession, go far to prove that the rocks of both these countries were posterior to the formation of the chalk.

At a monthly meeting of the Bombay Branch Royal Asiatic Society held in the Library rooms on Wednesday the 13th September, 1843.

The Hon. G. W. Anderson, President, in the Chair.

M. M. Etieune d'Quatremere, Member of the Institute of France, was proposed as an Honorary Member by Jas. Bird Esq. seconded by Jas. Burnes K. H. and Col. T. Dickinson,

In accordance with Art. ix. of the Regulations, the meeting proceeded to an immediate ballot, when M. M. Etieune d'Quatremere was duly elected.

M. M. Chas. D'Ochoa, was proposed as an Honorary Member by Jas. Burnes K. H. seconded by Jas. Bird Esq. and the Rev. G. Pigott, and duly elected.

* Read a letter from Mr. John Murray, of Albermale street, dated 2nd August, declining to undertake the republication of the Society's Transactions.

The Secretary was instructed to communicate with him or Messrs. Longman & Co. with a view to recover the copper plates.

Read a letter from the Honorary Secretary to the Royal Asiatic Society, stating that the 3rd number of the Society's Journal only had been received.

Duplicate copies were directed to be sent by the first opportunity.

* At the Monthly meeting of the 14th June, the Secretary submitted to the meeting a proposal by Captain LeGrand Jacob that the Society republish many of the valuable papers in the Transactions.

It was resolved that the Secretary be directed to communicate with Messrs Murray & Co. on the subject of republishing the 3 vols. of the Transactions in an octavo size, and that the further consideration of the subject be deferred till their answer is received.

The list of members referred to in this letter, was sent by the June mail.

The following papers were read:—

1. * A letter from J. P. Malcolmson Esq. M. D. of the Bombay Medical Establishment, forwarding a specimen of volcanic rock from Aden, containing metallic mercury, with remarks.

2. * Chemical and microscopic examination of the rock salt of the Punjab, by H. Giraud, Esq. M. D. Bombay Medical Establishment.

The Secretary laid the following donations on the table, from M. M. Chas. D'Ochoa:—

1. Copy "Exercices Pratiques L'Analyse de Syntaxe et de Lexigraphie Chinoise," par S. Julien.

2. "Examen Methodique des faits qui concernent le Thain-Tehn ou L'Inde," par G. Panthier.

3. "Vindicia Sinica. Derniere Réponse à M. S. Julien," par G. Panthier.

4. "Réponse a l'Examen Critique M. S. Julien, Inséré duas le Numéro de Mai 1841. Du Journal Assiatique," par ditto.

The thanks of the Society were voted to the authors of the papers, and to M. M. Chas. D'Ochoa for the works presented by him.

Copies of the "Vispárád" and "Yáçná, lithographed for the Society, were laid on the table, and it was resolved that copies of the work should be presented to the undermentioned Societies.

The Asiatic Society of Bengal.
The Literary Society of Madras.
The King's Library, Paris.
The St. Petersburgh Academy of Sciences.
The British Museum.
The Dublin University.
The Asiatic Society, Paris.
The University of Bonn, through Professor Lassen.
The Berlin University Library.
The Royal Asiatic Society.
The Edinburgh University.

* Printed in No. 6, of the Journal.

The University of Leyden.
The Cambridge University, and
The Bodleian Library, Oxford.

It was resolved that copies of the "Vandidad" sent to the Bodleian and Cambridge University Libraries, by two of the members, should be presented in the name of the Society.

The Secretary was directed to present the following works of the Society to Mr. Chas. D'Ochoa:—

A copy of each of the Society's numbers already published, and a copy of the "Vandidad," "Vispárád," and "Yacna," lithographed by the Society.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in the Library rooms on Wednesday the 11th October 1842:—

The Hon. G. W. Anderson, President, in the Chair.

The following papers were read:—

1. On the ruined City of Beejapoor, its Persian inscriptions, and translations of the latter into English. Part. II. By James Bird, Esq.

2. On the derangement of the atmosphere between the tropics which occurred at the period of the late comet's appearance, by Captain C. Giberne, 16th Regiment N. I.

The following donations were made to the Library:—

By Government, Part I. Vol. III. Wight's Icones Plantarum.

To the Museum.

1. A beautiful collection of minerals from an excavation in the lines of the Sappers and Miners within the Poona cantonments, by Captain F. Wemyss, Engineers, through Colonel Dickinson.

2. A large and beautiful slab of the sulphate of lime, by Col. G. R. Jervis, Engineers.

Laid on the table, a specimen copy of the *Collection Oriental.*

Resolved that the Secretary do order it, if not above 100 franks per volume.

Dr. Burnes then called the attention of the meeting to the approaching departure of Col. Dickinson, one of the *Vice Presidents* of the Society, and proposed the following resolution, which was seconded by the Rev. G. Pigott:—

"That at the next meeting, it be taken into consideration, how the Society can best mark its sense of Colonel Dickinson's zeal and diligence in forwarding the interests of the Society.

Resolved unanimously that the above motion be notified in the usual monthly circular, calling the next meeting of the Society.

At an Anniversary Meeting of the Society held in the Library rooms on Thursday the 9th November:—

The Hon. G. W. Anderson, President, in the Chair.

The following papers were read:—

1. Miscellaneous remarks on the observations now in progress at the Observatory, Bombay, in reference to Atmospheric pressure, accompanied by plans indicating the variation of the Barometer and Sympiesometer, in reference to this subject, by G. Buist Esq. L. L. D.

2. Memorandum on the Mahratta literature published at the lithographic presses of Bombay, by R. X. Murphy, Esq.

From the Private Secretary to the Honorable the Governor, transmitting a letter from the Secretary to the New York National Institution, proposing to open a correspondence with the Society.

Resolved, that the Society accept the offer of the New York Institution, and that the Secretary be directed to communicate the same to the Private Secretary of the Honorable the Governor, for the information of the Institution.

The Secretary called the attention of the Meeting to a report of the Proceedings of the Asiatic Society of Bengal, in which an application was directed to be made to the Supreme Government for copies of the Observations made at the Magnetic and Meteorological Observatory of Bombay, and suggested that a similar application should be made to the Bombay Government on behalf of the Society.

Resolved, that application be made for two copies of these papers, one for the Library, and one, for more careful preservation, amongst the works of reference.

The Secretary submitted a memorandum on the progress made during the year in augmenting and arranging the Museum.

The new catalogue in a nearly finished state was laid on the table. It was stated that, it contained all the details usual in Catalogues of Libraries in Europe, and that the old arrangement of the books had been as little altered as possible, consistently with finding space for the books of those departments which had been greatly augmented during the last few years, and with the adopted recommendations of the special Committee.

The Society directed that the best thanks of the Society should be communicated to Charles D'Ochoa, Esq. Honorary Member of the Society, for his great and disinterested exertions in the arrangement of the Library and the formation of the Catalogue.

The following motion of which due notice was given, was then brought before the meeting:—

That in consequence of the approaching departure of Colonel Dickinson, one of the Vice Presidents of the Society, it be taken into consideration at the meeting how the Society can best mark its sense of Colonel Dickinson's zeal and diligence in forwarding the interests of the Society.

It was proposed by Dr. James Burnes, K. H. Vice President, and seconded by the Rev. G. Pigott:—

That the Society cannot allow Colonel Dickinson to vacate his place as Vice President, without tendering to him its best thanks for the great attention, which during a long period of years he has devoted to its interests, and for the many useful suggestions he has at different times offered for the advancement of its objects.

Resolved unanimously that the Secretary be directed to forward a copy of the above resolution to Colonel Dickinson.

The accounts of the Society were laid on the table.

The Society then proceeded to the election of Office-Bearers for the ensuing year.

The Office-Bearers elected were as follows.

PRESIDENT.

The Honorable G. W. ANDERSON.

VICE PRESIDENTS.

The Right Rev. LORD BISHOP of Bombay.

The Honorable J. H. CRAWFORD.
JAMES BURNES, K. H. F. R. S.
The Honorable Sir ERSKINE PERRY, Knight.

Committee of Management.

C. MOREHEAD, ESQ. M. D.	J. L. PHILIPS.
The Rev. G. PIGOTT.	JAMES BIRD, Esq. F. R. G. S.
W. HOWARD, Esq.	Col. G. R. JERVIS.
J. HARKNESS, Esq.	The Rev. J. M. MITCHELL.
G. BUIST, Esq. L. L. D.	S. S. DICKINSON, Esq.

J. G. MALCOLMSON, F. R. S. Esq. Secretary.

MESSRS. FORBES, & Co. Treasurers.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society held in the Library rooms on Wednesday the 13th December, 1843.

The Hon'ble G. W. Anderson President, in the Chair.

Read a letter from Lieutenant Colonel Dickinson, acknowledging receipt of copy of the resolution of the monthly meeting of the 10th November relative to his retirement from the office of Vice President.

Read a letter from Dr. F. Tanman Junior, dated Berlin, July 6th 1843, acknowledging the receipt of a box of Geological Specimens forwarded to him, and requesting to be supplied with a series of Zeolites from Poona, also offering to forward another collection of rare minerals for the Society's Musuem.

Read a letter from W. Escombe Esq. Secretary to Government, presenting 2 copies of the Alif Laila to the Library, by Government.

Read a letter from H. Torrens, Esq. Secretary to the Asiatic Society of Bengal, acknowledging the receipt of a copy of the Vendidad, and of a box of Geological Specimens, and presenting to the Library a series of oriental works, ordered by the Society through Messrs. Thacker and Co. Also a letter from these Gentlemen mentioning their having received the books free of charge.

Skins of two species of bears, and a collection of skins, skulls, and

horns of various mountain sheep and antelopes, were presented by Dr. Elliot, late of the Indore contingent, through the Secretary.

A note from J. G. Malcolmson, Esq. was read by the acting Secretary, referring to a very fine silicified palm tree, and the lower jaw of a Mastodon discovered in February at Peermocha near Broach, and presented to the Society. They were found in a marine tertiary sand stone conglomerate which extends over a considerable part of the Broach and Rajpeepla districts.

The following works were presented by Manockjee Cursetjee Esq. Memoires des Antiques du nord, and Ultimi progressi geographia.

The thanks of the meeting were directed to be communicated to the respective donors.

The meeting then adjourned to Wednesday the 10th January, 1844.

JOURNAL

OF THE

BOMBAY BRANCH

OF THE

ROYAL ASIATIC SOCIETY.

MAY, 1844.

ART. I.—*On the ruined city of Bíjapúr, its Persian inscriptions, and translations of the latter into English.* By JAMES BIRD, Esq.

PART II.

As the interesting ruins of Bíjapúr in the Dekhan, have afforded matter for two papers already published, * it would be now unnecessary to revert to this subject, had there been nothing left to either add or correct. No sketches of the buildings, however, nor any copy of the Persian inscriptions to be met with, having accompanied the former accounts, the necessity for further detail still exists; whilst the Brahminical remains, within the citadel, which have almost escaped observation, and the Haly-Kanara inscriptions, until now undeciphered, being subjects of curiosity, naturally lead us to inquire into the condition of this part of the country, preceding the foundation of the Adil Shahy state: which, as the most powerful of the five Mahomedan kingdoms of the Dekhan, existed from about A. D. 1500 to 1685, and had its origin, in the distracted affairs of the prior Mahomedan dynasty of Bíder, during the turbulent reign of Mahomed Shah Bhamany.

* The one is, by Captain Sydenham, in the 13th volume of the Asiatic Researches, p. 432, Quarto Edition; and the other is, by Captain Sykes, in the Bombay Literary Transactions. The latter professes to be only notes regarding the principal buildings, and a traditionary account of their origin.

The capital called Bíjapúr, or Vijayapúr* meaning the city of victory, was subsequently named Bídpúr, or Vidyapúr, the city of learning. It stands in the midst of an extensive arid plain, in Lat. 17.9' north, between the Bima and Krishna rivers; and, though now containing but few inhabitants, is visited and admired by many, attracted there by curiosity to view its extensive ruins and stately mausoleums.

It is nearly south-east from Poona, at the distance of two hundred miles, and is about one hundred and thirty from Satara. The road from either leads through a very uninteresting country, offering little or nothing that is worthy the attention of a traveller, and fatiguing the eye with the continued succession of trap rocks and barren heaths; while here and there narrow valleys and patches of scanty cultivation, barely supply food for the inhabitants, if not plentifully watered by the rainy season. The Satara valley is the most rich and fertile in the whole tract, and presents a pleasant diversity of tree and verdure in the plain, to relieve the barrenness of the surrounding mountains. Soon after leaving this, the country expands into undulating heaths, covered by stunted grass; and on the banks of the numerous water courses, descending from the distant hilly ranges on the right and left, the appearance of walled villages occasionally relieves the dreary sameness of the landscape.

The traveller, in approaching Bíjapúr from the westward, makes his last halting place at the village of Tíkota, which is thirteen miles distant from the Mekka or western gate of the city wall. There is a large Mahomedan building said to be the sepulchre of Malik Sandal; who was, as appears, an officer at the Courts of Ibrahim and Mahomed Adil Shah, the fifth and sixth kings of Bíjapúr.

About ten miles beyond Tíkota the first appearance of ruins commences, in the form of a broken down wall, or out-work, which is all that at present is remaining of the defences belonging to the village of Torgha, now called Torwah; and which was constructed, by Ibrahim Adil Shah the 2nd, when, about the twenty-fourth year of his reign, Hej. 1011, A. D. 1604, he removed the seat of Government from the citadel of Bíjapúr to this place. The astrologers having pronounced it would prove unlucky for him to remain longer at the former, he removed the Court at their suggestion to Torgha, and caused palaces and mosques to be built there, giving it the name Naorispúr, or the novel

* I have adopted Sir William Jones's system of orthography.

city. This event is placed by others, somewhat earlier, being Hej. 1006, A. D. 1597, * or the eighteenth year of his reign; but it seems probable that both dates are correct, and announce two different events; this referring to the commencement of the new city, and the other to the removal of the Court, on its completion. The new capital having been plundered, by Malik Amber of Ahmednagar, in Hej. 1031, † A. D. 1621, ‡ it was soon afterwards abandoned for the former residence of the Court; and when Aurungzeb took Bíjapúr, in A. D. 1686, it is described by the journalist of Aurungzeb's transactions in the Dekhan "as quite depopulated, its ruined palaces only remaining, with a thick wall surrounding it, whose stately gateways were falling to decay." §

In viewing Bíjapúr, from the neighbourhood of these ruins, and at a distance of three miles from the outer wall on the westward, we hail the first appearance of it as strikingly beautiful and magnificent. When I first saw it there happened to be light haze overhanging the City; but as this gradually unrolled itself from the buildings, before the morning breeze, leaving the large dome of Súltan Mahomed's tomb partly exposed, at a time too when innumerable slender minarets, buildings, trees and enclosures, burst into view, I here beheld a true picture of what the finest oriental cities have at all times been, and could scarcely persuade myself that this was not even then fully inhabited. Continuing to pass on however, through heaps of mouldering ruins, the illusive idea of population soon vanishes; and though palaces, mosques, caravanserais, and streets of fallen houses, point out where it once existed, scarcely a single inhabitant is to be met with, until after having passed these remains of the suburbs, we terminate our journey of three miles, at the Mekka gate. Here, as in other parts of the East, the huts of slaves and traders were to be found in contact with the magnificent dwellings of the great and noble; but the extensive enclosures surrounding the palaces of the rich, diversified as they were by trees, gardens, and summer houses, with the numerous bazars, now pointed out by the streets on either hand, and the

* In the Hindústaní history of Bíjapúr, Hej. 1009 is the date given for this.

† In the Hindústaní history the date of this is Hej. 1033.

‡ The words commemorative of this event are ویران شد آن نورس با ملک; this new City was made a desert by Malik, giving the numerals Hej. 1031.

§ Scott's Ferishta's Dekhan. Vol. ii. p. 73.

public edifices of mosques and tombs, possessing all the magnitude and beauty of architecture that was in keeping with the spirit of the times, render this one of the most interesting of cities.

Arriving at the outer wall we enter the enclosed town, or Pettah, by the Mekka gate; and find that between this and the ditch of the citadel or inner fort, there is a wide space occupied by mosques, tombs, gardens, and tamarind trees; leaving a sufficient open space, however, for a large encampment of horse and foot, when required in the event of a siege.

After this general description of a once celebrated city, it now remains for me to give some detailed account of the most remarkable of its edifices. I may here limit my observations to two heads; the one illustrative of the buildings in the citadel and enclosed town, the other of those in the suburbs and city on the westward.

THE CITADEL AND ENCLOSED TOWN.

The wall of the enclosed town, which is many miles in circumference, is flanked by numerous semicircular towers; and was, at one time, strengthened by a ditch and covert way, now in many parts destroyed and admitting cultivated fields to closely approach the curtain. It is strongly built of stone and lime with a parapet nine feet in height and three in thickness; and was completed by Alí Adil Shah the 1st, in the era of the Hej. 974, A. D. 1566, or two years after he and his Mahomedan confederates had overturned the neighbouring Hindú principality of Vijayanagar, sometimes called Bíjanagar.

The citadel, which is within this enclosure, and is placed more particularly to the west side of its irregular square, is defended by a rampart, round towers, and fause bray, having also a wet ditch about one hundred and twenty feet in breadth. The ditch, which was kept completely flooded in former times, is now nearly dry on the north side; on the south, it is of considerable depth, and contains small fish; but there are no alligators as mentioned by Tavernier. It would appear that the water of the ditch on the north side has been at all times deficient, there being a double wall and second wet ditch at that part. The only entrance to the fortification is on the east face, by two gateways;* the

* There is another gateway, on the north-west side, leading, through the

inner one of which has a door made of wooden planks clamped by iron plates, which are rivetted on the other side, by strong pegs of the same metal.

Having here passed into the citadel we come immediately to four pillars of polished black basalt, * three of which are situated on the right and one on the left hand side. They belonged to a Hindú temple, as would appear, and were made an offering, Captain Sydenham says, by the widow of Ráma Rája, to Súltan Ali Adil Shah the 1st, when the Bíjanagar kingdom was ruined by the Mahomedan confederacy, at the battle of Telicotta, as before noticed. But, in the absence of well authenticated information on this point, I may be permitted to doubt the truth of this report; and, as similar pillars are to be met with among the Bráhminical remains near by, it seems probable, that if not carried away from Bíjanagar to be a vain glorious boast of victory and a triumph of the Mahomedan faith, they were formerly part of the Hindú temple now standing in ruins on either hand; and through which the present gateway was carried, on the first foundation of the citadel by Yúsaf Adil Shah, who according to Ferishta and others built the fort.†

Two other rows of pillars are to be seen a few paces further on to the right, and three similar ones to the left, which are the only remaining parts of the Hindú temple just alluded to. Though not uniform in shape, the pillars consist generally of a plain base, a rudely carved shaft with a square projection in the middle, and an overhanging capital. Many of them are inscribed at the base, to commemorate grants of land given to the temple by the Rajput families of Chalúkya and

inner wall on that quarter, to a Hindú temple, yet kept in repair, and which may have ween dedicated in former times to the ladies of the Harem who were of that persuasion.

* Not black marble, as stated by Captain Sydenham.

† The building of the Fort is placed by the author of the Busatin-us-Sulatin in Hej. 919, A. D. 1513; being three years after Yusaf Adil Shah's death,—according to Ferishta, whose historical records bear, generally, every mark of fidelity and truth. The death of Yusaf Adil Shah, the first king of Bíjapur, is differently fixed in various histories. The Tab-kati Akbary places it in Hej. 913, A. D. 1507; the Tarikhi Mír Ibrahim Asad Khany in Hej. 927, A. D. 1519; and Ferishta in Hej. 916, A. D. 1510. The Chronogram given by the Tarikhi Asad Khany is يوسف شاه جنتی and furnishes the numerals for its date; but as this history appears to be the same with the

Yadava, * who were the reigning Hindú princes, in this part of the country, previous to the first Mahomedan invasion of the Dekhan, about the beginning of the 14th century. The oldest of the grants, which is written in Sanscrit, and in the Haly Kanara character, announces the appropriation of a gift of land to this temple of the deity Narasinha,† by Chalúkya Mula Devara, in the Shalivahan period 1114, or A. D. 1192.‡ There is a similar gift to the same deity, written in the name of Shankrapa Danda Nayk, the military prime minister of Yadava Narayana, a Chakrawarty Raja, during the forty-sixth year of that prince's reign, or in the 1162 year of the Shalivahan period, A. D. 1240, being forty-eight years later than the former.

The whole style of sculpture is here very similar to that of the Ellora excavations; and if not told by the inscriptions that this temple was a Vishnava one, we might conjecture that such had been its dedication, by simply forming an opinion from the subjects that have been represented on the square projections of the pillars. Among the mythological devices there is one of a cross legged figure sitting with the hands joined, as if employed in devotion, whilst on the right and left there are two standing figures in attendance. It is intended, probably, to represent an ascetic, in the act of worship; but a Bráhmin who was with me conjectured it to be a Jain deity. There is a representation, also, of Ganesha on another pillar; and of Krishna killing the serpent Kalya, as related in the Bhagavata. The image of the elephant is also sculptured; and though diminutive like all the others, it is so far interesting that it shews how here, as in the excavations of the Dekhan, it held a conspicuous place in the mythology of the people, who, some centuries back, professed the Hindú religion in these parts.

Tarikhi Haft Kúrsy, which was written in the reign of Ali Adil Shah the 2nd, it is not entitled to so much credit as Ferishta who wrote nearer the time, and with the best authorities before him.

* The Chalúkya and Yadava tribes are two of the thirty-six races of Kshetryas, or Rajputs, enumerated in the Prithvi Rai Rayasa; which is a history of Prithvi Rai the last Hindú king of Delhi, and was written by the bard Chandra, about the date of these inscriptions. Some account of this work will be found in the September number of the Calcutta Oriental Magazine, where the origin of the mountain Abú, in Khatyawar, is detailed at length.

† Vishnú in his fourth avatar when he descended as a man-lion.

‡ This is the year in which Prithvi Rai, called Pithao Ray by the Mahomedans, fell in the battle at Tahnesar, fighting at the head of the whole assembled Rajput Princes of India to oppose the invasion of Mahomed Ghory.

Proceeding onwards from the temple we come to a yet more extensive Hindú building, which is situated to the left. This is an Agrahar, or Bráhminical College, which the Mahomedans converted into a mosque, by placing therein a Mambar, or pulpit, and writing the confession of faith over the Mehráb, or arch of the altar, on the westward. It possesses a large enclosed space in front, which is entered by a vestibule; whose portico, being extended into wings, occupies the complete length of the Agrahar. On entering the area we find that the building consists of two stories, and that the lower presents a front of ten tall columns, each of a single stone, placed six or seven feet distant from the other, and deepening backwards at right angles in rows of six columns each. The style of the architecture is that which is common to the oldest Hindú buildings in the Dekhan, and exhibits massy pieces of quartz stone-rock, * passing from one pillar to another, in order to form the roof; these being laid along each other, in a similar manner, for the walls, without having been originally joined together by lime or any other cementing substance.† There are also one or two pillars of black basalt, which do not appear to have belonged to the original building; as all the others are of the quartz rock, which must have been brought from some distance, there being no appearance of this mineralogical formation in the immediate neighbourhood.‡ A smaller, though in other respects similar Agra-

* It might be classed without much impropriety as a species of sandstone.

† This is the Cyclopeian mode of building, and is very similar to the style of the temples in Kashmír as described by Ferishta.

‡ The author of a modern history of Bíjapúr quotes the authority of the Taríkhi Mulhakat to show that this building was originally a mosque, and constructed by the Mahomedans. According to his account Aiz-ad-din Abúr Jah, one of the nobles of Ala-ad din Khiljy, king of Delhi, was governor of the place in Hej. 801; and in 807. A. D. 1307, he erected a wooden mosque at the request of the Hindú minister of Raja Ram Deo of Devagarh. His son Karim-ad-din Abur Jah, in Hej. 716 A. D. 1316, caused a stone mosque to be constructed, and his name is accordingly mentioned by the following inscription, in the Balbud character, on one of the pillars. A curious admixture of corrupt Arabic with Sanscrit occurs in the inscription; and is a remarkable specimen of what must be considered the Mahratta language at that time.

The account of the building given on the authority of the above history, appears apocryphal.

har is to be met with on the north-east of what his called the Adawlat Khanah; and both would indicate that there must have been a considerable Hindú town here previous to the time it was fortified by the first king of Bijapúr. In answer to the numerous inquiries I made on this subject, I could only receive the unsatisfactory information that they were founded by a Hindú raja, named Bijan Rai, whose capital was Mangalbíra, * and in whose time, it is said, a Búrj or round tower now standing was built. It is also traditionally related, that soon after this time, Pír Mabrit Khandayat, † the leader of a body of Mahomedan fakírs, having come here expelled the Bráhmins from the Agrahars, and propagated the faith of Islam, previous to any regular invasion of the Dekhan by an army;—and that when Yusaf Adil Shah founded Bijapúr, this town was called Bijan Hully. ‡ The tomb of the Pír's son,

॥ श्रीग. ॥

स्वस्ति शके १२४२ रौद्रसंवत्सरे श्रीयुद्धभुरीणनामविजयराज्यो दयिततनिपोनमलिकू करीमदीनदक्षिणवाराणसीविजयापुरीवरीलमषितीकरविली. सालहोउटगेचासुतारूरेवेया णेमषितिकेलिमोलकेमासकरूनुषेविकरिशेतवेतनचोवीसचावरचोवीसहातनिश्चितकरूनुदिधली. मंगलमाहश्री.

In, the fortunate year of the Shaka, or Shalivahan period 1242, and A. D. 1320 in the Raodra year of the Cycle, the hero and victorious ruler named Malik Karím-ad-din, who like the sun is all powerful, erected the upper part of the mosque. Revoiya a carpenter of the village of Salhśodagé, constructed the mosque; and agreed to receive as the price of his labour a saleable freehold estate of twenty Chawar of land of twenty cubits, which was fixed and given. May it greatly prosper.

* Mangalbíra, or Mangalivíra, is a hill-fort near the Maun river which flows into the Bíma, and is about fifteen miles S.S.E. of Panderpúr.

† The Kshetryas, or Rajpúts of Orissa, who are the feudal lords of the soil, and hold it on condition of service, are called Khandayats; (see A. R. Vol. xv. p. 222,) and if any such occurrence, as above related, ever took place, it may have been caused by a body of converted Rajpúts, driven southward in the progress of the Mahomedan arms on the north.

‡ Meaning the village of Bíjun, and I am disposed to think that this was inscribed by order of Malik Kafur, who was the general of Alla-ad-din Khiljy, the first Mahomedan conqueror of the Dekhan. The style of the architecture is more Hindú than Mahomedan, though this certainly might arise from the circumstance of a Hindú workman having constructed the building.

which is within the open area of the largest Agrahar, is built of lime and stone, and is covered with Arabic sentences from the Koran, now much defaced. His own burial place is to the eastward, at some distance, and his descendants, who yet reside there, possess some rights in the village of Tinié Hally, not far from Bíjapúr.

The Mahomedan buildings in the citadel are completely in a state of ruin, if we except a small mosque called the Mekka Musjid, which was built by the 1st Alí Adil Shah. It is also named from having a representation of that celebrated place on its Kaba, and is a small chaste building, consisting of twelve arches, supported by an equal number of finely cut stone pillars, disposed in a square. Behind this, and to the north, stood the Adaolat Khanah, where the kings usually received the congratulations of the multitude and the petitions of the poor. It consisted of two stories, with wide verandas, elevated on large wooden pillars, and was standing when I first visited Bíjapúr; but, in consequence of the building falling quickly to decay, the Raja of Sattara has lately taken down the whole; and the only remaining parts now to be seen, are the ruined fountain in the garden, and the terrace where people were usually allowed to present themselves. This building was erected by the 1st Alí Adil Shah.

On the right of it, and adjoining, was the Sona Mahal, or gilded palace, which was burnt down. A little to the westward, and in front, we observe the Ananda Mahal, or Harem, which fronts the south. It consists of three stories, each story having a middle hall and smaller apartments, at either end, communicating with it through narrow arches, which may be shut up by curtains when necessary. It had formerly two wings, towards the north, similarly built; and all parts of the building communicated by means of narrow staircases. The whole is crowned by a board terrace, and a wall nine or ten feet in height, surmounted by many small minarets to give the buildings a finished appearance.

To the west of this place is the Dhobí Mahal; and to the south the Sejadah Mahal, or Sath Khandí. * The walls were formerly covered with fresco paintings, and portraits of people belonging to the Court, most of which are now defaced. I observed, however, an elegant por-

* It was named the Sejadah Mahal from being a place of retirement for the princesses to pay their devotions; and took the appellation of Sath Khandí from being seven stories high.

trait of a Mahomedan priest, whose features were Turkish, and complexion very fair. There is also a drawing of Mahomed,* the sixth king, in company with his favorite dancing girl Rhamba. He is seated on a cushion, near which are laid his Sehtar,† a basket of flowers, and a Persian book. The expression of his countenance is that of good nature, and much kindness of disposition; virtues for which he is yet celebrated among the people, and has been frequently praised by historians.

The only other thing that formerly attracted notice, at the citadel, was the stone representation of Rama Raja's head. It was on the right of the gate at entering; but, having been removed from thence by the Raja of Sattara, was lately thrown into the ditch.

The Pettah, or enclosed city, was formerly divided into numerous quarters; each being distinguished by the appellation of the different bazars, or market places, in its immediate neighbourhood. Some of the divisions yet known are the Khizanah, Jamaa Masjid, Chauk, Karinja and Padshapur bazars; there being many others of inferior note that have lost their titles, or are little remembered.

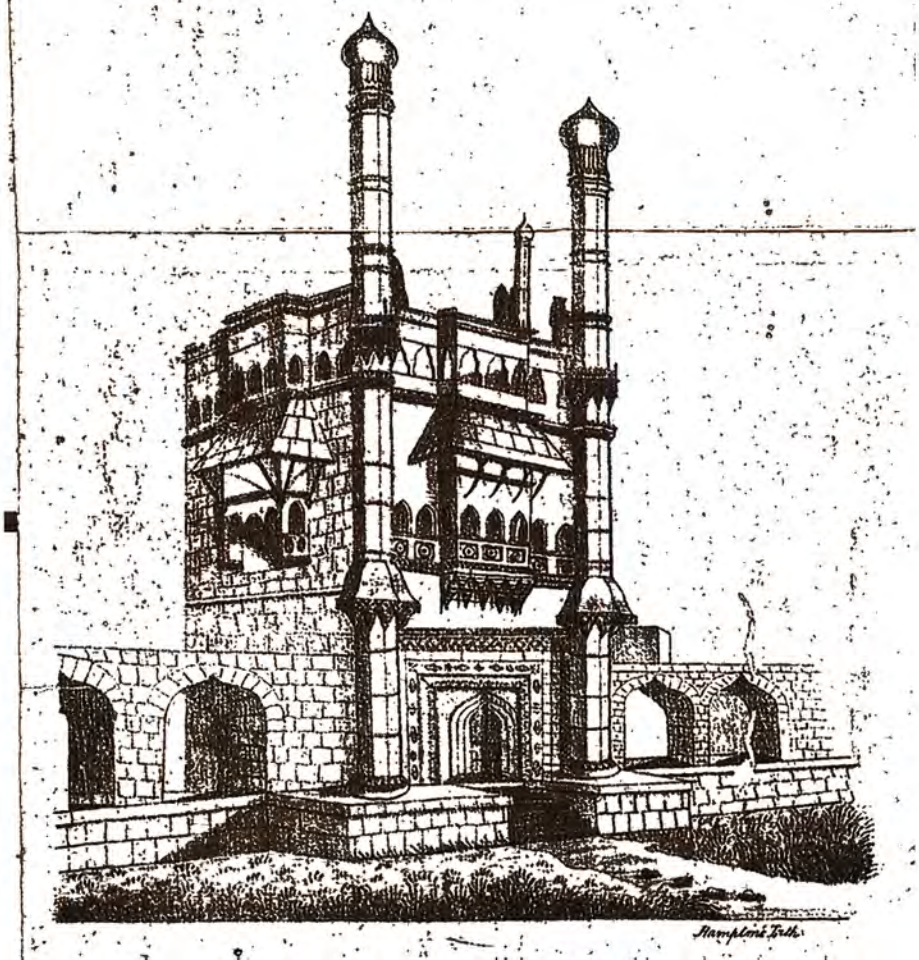
Proceeding directly eastward, along a broad and handsome street, leading from the entrance of the citadel, we come immediately to a row of small arches on the right. These were once used as shops; and from having then served for the foundations of a treasury, palace, state prison, and other buildings, were known by the name of the Khizanah bazar.‡ Somewhat further on, and on the same side is the site of the Mehtry Mahal; § concerning which an absurd story is in circulation, among the vulgar, and has been retailed, without examination, by others, that it was built by a sweeper, or Halalkhor, who had become unexpectedly the possessor of considerable wealth, in consequence of being the identical person who met Ibrahim Adil Shah the 1st, when, in his sickness, he had made a vow, to present a certain sum of money to whomsoever he should first see on a certain morning, and which resolution was adopted, at the suggestion of a crafty astrologer, who insured his recovery, and intended to profit by the remedy. This idle tale has no foundation but what the

* Captain Sydenham says Ali Adil Shah.

† The three stringed guitar.

‡ The treasury market.

§ The princely palace.



ignorance of the vulgar has given it: for the difference of meaning in the Persian and Hindústaní word *Mehtar* not being known to them, they have affixed the appellation of a sweeper, in the latter language, to that which designated a lord, or chief, in the other, and which was the title too of this building from its original foundation. It is a small but elegant structure, of three stories high, having minarets at the corners and in front, * with ornamental carving, in soft clay stone, about its windows.

On the left, and almost opposite to this, four large Gothic looking arches draw our attention. They formed the gateway leading to the palaces of Mústafa Khan Ardistany, † and Ewaz Khan; the former of whom was a distinguished nobleman at the Bijapúr Court during the reign of its 4th king.

We next come to the Jamaa Musjid, or great mosque, which was built by Alí Adil Shah 1st, during the life of his father Ibrahim the 1st: and the following Chronogram, which is near the altar piece, gives the date of the structure, Hej. 943, A. D. 1536.

‡ بیا بمسجد سلطان عاقبت محمود سنه ۹۰ عرم

"Enter the mosque of the Súltan whose end was happy."

It is an extensive edifice, surrounded on the north, west, and south sides by a high wall, of nearly forty feet in height; which concealing the dome gives the whole a clumsy appearance from without. The wall has a lower story of false arches, raised on a plain base of six or seven feet in height, and an upper one, or narrow arcade, opening externally, along which runs a passage, communicating with the roof of the mosque. We enter by a door on the north side, and find ourselves in an extensive court raised about six feet high; in the midst of which there is a fountain, and on the right a raised pavement of two feet high, front-

* See the drawing of this.

† He was murdered, about the year A. D. 1581, by Kishwar Khan; who, on the death of Alí Adil Shah first, having seized the reins of power from Kamil Khan, (a nobleman frequently mentioned by the Portuguese writers, then Regent for the minor Ibrahim Adil Shah II,) ruled the state.

‡ Captain Sydenham has given a wrong reading and consequently wrong date of this Chronogram, by substituting بنا for بیا, thus furnishing the numerals Hej. 991. A. D. 1583, and placing its foundation in the reign of Ibrahim the II. instead of Hej. 943 A. D. 1536.

ing the mosque on the east. The body of the building consists of a magnificent arcade, two hundred and forty feet broad, by one hundred and thirty eight. The pillars are all equi-distant something more than twenty-six feet from centre to centre, and elevated twenty-five feet. From them spring arches, of the usual pointed shape, common to musjids, which support a flat dome resting between every four pillars. In the centre of the floor below, there is a clear space of 75 feet, over which rises the large external dome of an egg shape, and whose span of fifty four feet is raised eighty feet from the pavement. On the north and south walls there are two handsome piazzas, that consist of seven large arches and run from the body of the mosque, to about one hundred and eighty-six feet.

The Mehrab, or altar on the west, is elegantly gilded, and displays above its centre the following inscription :—

الله محمد ابوبکر عمر عثمان حیدر

"*Allah, Mahomed, Abúbikir, Omar, Osman, Hydar,*"——* which informs us that Mahomed the sixth king, by whose orders the ornaments were made, was of the Súnní sect † of Islam, though all the others, excepting Ibrahim the 1st, was of the Shía persuasion.

There are several other inscriptions among which are the following:—

ایں محراب سلطنت یاد دارم زینت یا فته سلطان محمد عاد لشاہ

"I remember that this royal altar was ornamented by orders of Mahomed Adil Shah."

بر قصر عمر تکیه مکن استوار نیست در دار بیقرار کسي را قرار نیست

"Place not reliance on this life because it is not steadfast, and in this house of inquietude nothing is at rest for any one."

خوش منزلیست دنیا رونق بچشم ما خوش دولتیست عمر ولي پا یدار نیست

"Pleasant is the stage of the world now sparkling in mine eye; and happy is the lot of my life but it is fleeting."

* The name of Ali, the son-in-law of the Prophet.

† The Turks are of this faith, acknowledging the three first Khalifs; and the Persians are of the other, acknowledging Ali and the twelve Imams.

بندهٔ درگاه غلام سلطان محمد شاه خلد الله ظله العالي یاقوت دابولي سنه ۱۰۴۵.

"Yakúti Dabúly * was the servant of the mosque and the slave of Mahomed Shah, whose shadow may God continue to support. Hej. 1045 A. D. 1635."

The aggregate height of the dome, from the ground to its apex, may be about one hundred and twenty feet. The floor below, which is chúnamed, † is divided by black lines into numerous square portions, or *musallas*, made agreeably to the order of Aurangzeb, when he took Bijapúr and carried away the velvet carpets, along with a large golden chain, and other valuables, belonging to the mosque.

After leaving the *Jamaa Musjid* and going northwards, we come to the *mausoleum* of Mahomed, the sixth king. It is chiefly remarkable for its dome being of equal extent to that of St. Paul's of London, but being composed of brick and lime, and built out of all proportion to the other parts of the edifice, it ceases to be an object of much wonder, and can bear no comparison in point of beauty with the other.

The tomb itself, a heavy looking building of a quadrangular form, has an octagonal minaret at each corner, ascending from below, and is built on a terrace of six hundred feet square and two high. Each face of it presents three elevated false arches, of a Gothic appearance, rising from the pavement, and supporting several feet of plain lime work and plaster above; whilst the whole is surmounted by an ornamental cornice of grey basalt, and a balustrade, six feet high, terminating in small cupolas. The base of the middle arch is of grey basalt, and the two others of stone-work and plaster. The minarets at the corners consist of eight octagonal rooms, or stories, twelve feet broad; which lead into each other by means of winding stair cases, which are terminated above by cupolas, communicatnig with the terraced roof of the building. Each of these stories has seven small arched windows, opening outwardly and looking into the court below; while the eighth one admits a passage for the circular stair case. From this, also, we

* The appellation for a tribe of Abyssinians known in India.

† This, except to those in India, requires explanation. The fine carbonate of lime, called Chúna or Chúnam in this country, is of such a nature as to take a polish little inferior to the smoothness of marble; and is generally used for the floor of buildings.

enter the large dome and arrive on a broad ledge surrounding its interior edge. It is large enough to admit of a carriage being wheeled round it, and rests on supports, that inclining inwards in curves, resemble half arches. The cupolas and dome communicate with each other by numerous niches; and the echo of the voice on the wall being thus broken, is rendered less distinctly audible than it otherwise would be. The whole height of the tomb may be a hundred and fifty feet. There is a commanding view of the town and surrounding country from its terraced roof; where may be seen the broad expanse of barren heath and falling ruin, stretching in melancholy grandeur before us.

We enter the body of the building by a lofty door-way on the south side, where the first thing fixing our attention is the grave of the king. It is covered with cloth, and placed in the centre of the structure, under a wooden canopy on a terrace. To the left of it, facing the spectator, are the graves of his youngest wife and the son of Alí Adil Shah, II. Those of his favorite dancing girl Rhamba, his daughter the Begam, and his eldest wife * who performed the pilgrimage to Mekka, are situated in succession on the right. On the inner side of the door-way, where we enter, there are several inscriptions, written in Toghra letters, to commemorate the year of the Súltan's death. The first is,

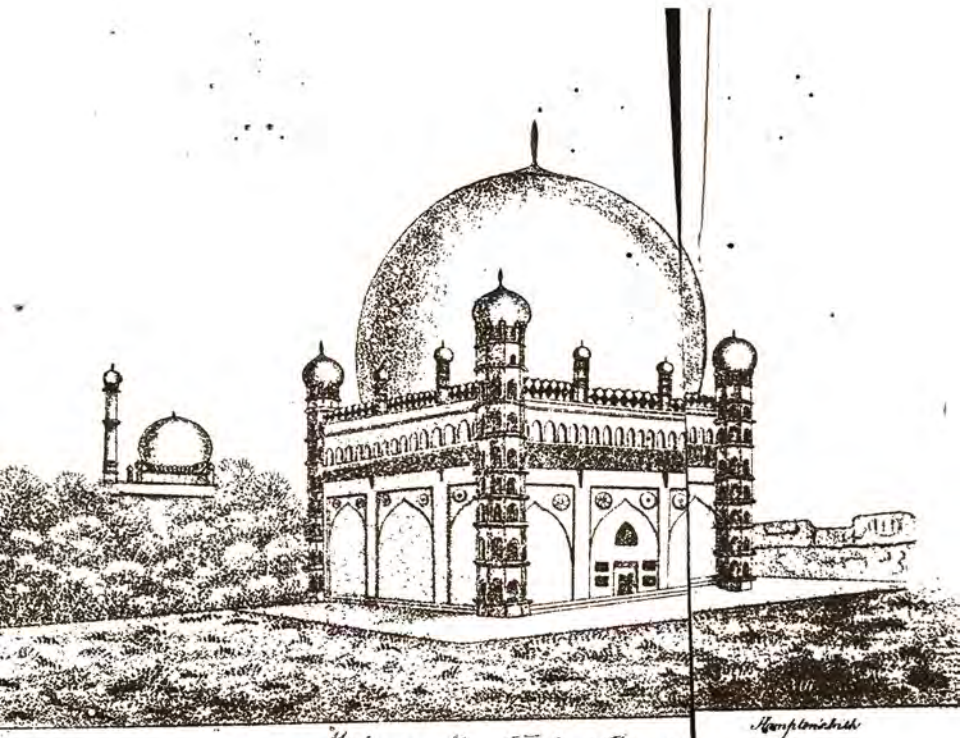
سلطان محمد جنت آشیانی سنه ۱۰۶۷

"Súltan Mahomed a dweller in Paradise," which words give the numerals, Hej. 1067 A. D. 1656.

The second,

عاقبت محمد محمود شد سنه ۱۰۶۷

* This is the lady spoken of by the traveller Bernier, in his notice of Bíjapúr. Bernier, who was in India from A. D. 1655 to 1667, says "Visiapoor (Bíjapúr) however, is verging towards dissolution. The Moghal has made himself master of Parinda, the key of the kingdom Bider, a strong and handsome town, and other important places. The death of the king, (Mahomed Shah) without male issue, must operate unfavorably on the future concerns of the country. The throne is filled by a young man, ("Alí Adil Shah") educated and adopted as her son by the Queen, sister of the king of Golconda, who, by the by, has been ill requited for her kindness. She recently returned from Mekka, and experienced a cold and insulting reception; the young monarch pretending that her conduct on board the Dutch vessel, which conveyed her to Mekka, was unbecoming of her sex and rank. *Brock's translation of Bernier, II. p.* 221.



Mahomed Shah's Tomb at Bijapúr

"The end of Mahomed was commendable," giving the numerals, Hej. 1067 A. D. 1656.

The third,

در السلام شه محمد شد سنه ۱۰۶۷

"King Mahomed was in the house of peace." This gives the numerals, Hej. 1068. A. D. 1657, thus differing by one year from the other. Such an occurrence, however, is thought of little importance among the orientals when the words of a *chronagram* appear appropriate. The true year of his death was A. D. 1657.

Opposite the east and west sides of the *mausoleum*, there are two ruined fountains; and at the end of a platform, on the west, there is a small but handsome mosque which remains in tolerable repair. The wall of the extensive enclosure belonging to the tomb, has become a mass of rubbish, and the *Nakar Khanah*, or gateway on the southern face, where the large drum was formerly beaten, is the only part of it now left entire. The dwellings in this neighbourhood were known by the name of Padshapúr bazar.

Returning westerly we come again to the fort diteh, where stands the palace of the Asari Sharíf, so named from its containing a few hairs of Mahomed's beard, called the relicts of the Prophet. It is a large and heavy looking building of brick and lime; whose magnificent verandah, thirty-three feet broad and one hundred and twenty long, has an elevated roof supported by four massy wooden pillars. We enter by a door on the south; and on our left find a stone stair case leading to the upper part of the palace; and to a hall of the same dimensions as the verandah, where are two large folding doors at the south and north ends. Having passed the latter, we come to a small closet, on the right, where the relicts of the Prophet are deposited; but which are only shewn once a year for the gratification of the faithful. These were formerly exhibited to the multitude from a small balcony which extends along part of the upper story. The building is accommodated with a fine reservoir of water, twenty-five yards long, sixty broad, and six deep, supplied from a distance, by several of the square towers called *Ganj*.

This palace, which was built by Mahomed Adil Shah, contains a library of Korans and religious books, copied in the best style of oriental

writing, but no works of history. * It formerly communicated with the citadel by means of a bridge, of which nothing now remains excepting the pillars, † and succeeded to the honor of holding the precious relicts of the Prophet, after another such building, within the citadel, had been burnt down.

Following the edge of the ditch, to the south west, we come to a massy square tower called the Chatr Ganj; which is one of fourteen such that were built by the unfortunate Afzal Khan, who met his death at the hands of Sívají, the founder of the Mahratta empire. ‡ These, which are contrivances for giving impetus to the water of an aqueduct, were built, it would appear, in the time of Mahomed Shah for the purpose of supplying the city. The following inscription, on the one first mentioned, must be read, with some interest, by all who have curiosity to know the condition of one so intimately associated with the first Mahratta leader, as was Afzal Khan. The inscription on the original is written in Toghra character.

بررای صنعت پیرای طراحان عجایب کارونادرهٔ کاران نگار خانه روزگار هویدا باد که بامر جلیل القدر بادشاه سلیمان بارگاه آفتاب اوج سرفرازی سلطان محمد بادشاه غازی خان اقبال تومان سپهٔ سالار دوران سر امد نویان دکهن دیندار کفر شکن مهبط انوار الطاف آلهی افضل خان محمد شاهی کز غرض سپهر کنزاعلی فضل فضلا و فضل افضل از هرملکی بجای تسبیح آواز آید که افضل افضل این نقب آب که موسوم به محمد نداست از بهر آسودگی خلق خدا باهتمام تمام بظهور آورده تا تشنه لبان عالم ازین آب سیراب دل و آسودهٔ خاطر گشته بدعای دوام سلطنت ابد پیوند پادشاه گیتی پناه رطب اللسان باشند سنه ۱۰۶۲

"Be it known to the executors of ornamental arts, the architects of important works, and to celebrated living workmen, that Afzal Khan Mahomed Shahy, a nobleman of good fortune, the present Comman-

* At the request of Lieut. Col. Briggs, the late Resident at Sattara, Mír Kheirat' Alí; commonly called Múshtak, the learned Persian Secretary of the Residency, made out a catalogue of the whole; but no historical works were discovered.

† See the sketch of this for which, as for most of the others I am indebted to the kindness of Mrs. Robertson, and Lieut. Ash of the Artillery.

‡ This happened in the month of October, 1659.

der-in-Chief, the first in rank of Dekhan lords, the religious destroyer of infidelity, on whom descends God's favor, whom heaven pronounces to be the most accomplished and excellent, and whose name like God's praise, is resounded from every quarter, saying it is excellence, did after much labour, and by order of Mahomed Shah Ghazy, (the exalted in dignity, whose court is like Súlymans, (Solomon's) and whose glory is as the sun,) render this aqueduct conspicuous, (calling it by the name of Mahomed Nidda,) for the convenience of God's people, so that whosoever should have a thirsty lip might have his heart filled and satisfied at this water, whilst his tongue would be moist in praying that this sovereignty of the king, the asylum of the universe, may abide for ever; Hej: 1063, A. D. 1652.

The unfinished tomb of Ali Adil Shah, II. is to be seen westward of the Asari Sharíf, and on the north of the citadel. It is a noble ruin of seven large Gothic looking arches, constructed on a terrace fifteen feet high and more than two hundred square. Had not the death of the Súltan put a stop to its progress, and prevented the addition of an upper story, in conformity with the original design, it would have surpassed every other building at Bíjapúr, both in magnificence and beauty.

There are several other tombs and buildings within the circuit of the enclosed town, none of which deserve more than a passing notice. Those most conspicuous are the two tombs standing together on the S. W. of the citadel. They are those of a celebrated Fakir, named Sídí Rehan, and of his pupil Khawas Khan; who, after the death of Ali Adil Shah, II. was appointed regent and guardian to his infant son Sekander. His tomb is to the southward of his preceptor's. In a direction S.E. from these, we come to the tombs of one of Aurangzeb's wives, and that of Kishwar Khan,* whose father, Asad Khan, plays a conspicuous figure in the early Portuguese transactions, as related by themselves. The former of these buildings, which is within an extensive square enclosure, had formerly a terrace, paved with white marble and railed with panelled work done in red porphyry; but the whole of the former has been taken away, and only one small piece of the latter was remaining when I first visited the place. The mausoleum of Ali

* Kishwar Khan, who was taken and put to death by one of the Nizam Shahy kings, founded the fort of Dharúr in the time of the 1st Ali Adil Shah.

Adil Shah I. lies a little to the southward of these, and near to the rampart of the outer wall. It is a low mean looking building, and, but for him who lies within, would not require a notice.

Besides these are also several round towers, which, according to the inscriptions on them, were built at different times by people belonging to the court. Of these the *Uperí*, or *Hydar Burj*, was built by Chanda Khan, Hej. 951, A. D. 1573, and is only remarkable for giving support to an extraordinary long gun that lies there.

Besides the aqueducts, which supply the town with water brought from Torwah, there are several large wells, of which the Taj and Chand Baorees are those best known. The former was the work of Senid-úl-múlk, the vizier of Súltan Mahomed; and the other was executed by Chand Bíbí, the heroic wife of Ali Adil Shah 1st, who has been deservedly immortalized by Ferishta for her celebrated defence of Ahmednagar.

It only now remains for me, as connected with this part of my subject, to notice that the famed piece of ordnance, called the *Múlkí Maidan*, is resting on a round tower of the outer wall on the westward, and that this bastion is known by the name of the *Búrjí Shirza*, or the lion bastion, from being ornamented with two lions' heads represented in stone. The following inscription, which is on the right hand side ascending the steps that lead to it, has recorded the date of this building:—

در زمان غازي خسرو علي عادل لقب آنکه داد داور زداد مرتضي فتح صبين
از جهاد سعد منجهلي شاه شد در پنج ماه
اين چنين برجي قوي بنياد چون کوه متين
هاتف غيب از کمال خرمي تاريخ سال بي بدل شد برج ثرزه گفت از چرخ برين
سنه ۱۰۷۹

"During the reign of the victorious king surnamed Ali Adil Shah, to whom by the favor of Múrtaza (Ali) God granted a distinguished victory, this bastion was, in the course of five months, made firm as the strong mountain through the fortunate endeavours of Mujly Shah; at which time an angel, in delight, gave the date of the year, saying that the Shirza bastion was without an equal." The last words give Hej. 1079, A. D. 1668.

The large gun of this bastion has been often the subject of panegyric; but has been no less frequently than erroneously described. It is

smooth and polished externally; and on being struck emits a sound like that of a bell. It is composed apparently of the same kind of alloy as is employed in manufacturing gongs * and hookah bottoms, but with some variation, probably in the proportion of the metals. The muzzle is wrought into a representation of the nose, eyes, ears, and extended jaws of some ravenous animal, probably that one called Shirza, † which appears to hold, in Mahomedan imagination, an equally fabulous existence as the *Húma*. The proportions of this piece of ordnance are as follows:—

Diameter at the breech,	feet	4 10	inches.
Ditto..... muzzle.....		5 2	ditto.
Ditto..... bore.....		2 4¼	ditto.
Length.....		14 3	ditto.
Diameter of the touch-hole.....		¾	nearly.

The horrors said to have followed the firing of this gun in the time of Aurangzeb, the traditonary tale of which kept possession of the imagination of the Bijapúrians for upwards of a century, were falsified by the test of sober experience on the 5th of January 1829, when this gun having been charged by the Raja of Sattara's orders, with eighty pounds of coarse powder, was fired without any remarkable event following.

The people, on learning the Raja's intentions to try the experiment, left the city in alarm; but were soon relieved from their unnecessary terror by the report of the explosion; which though loud came not near their exaggerated ideas. Even had the powder been better than was used on this occasion, the effect would have been nothing wonderful.

It has been erroneously stated, by former writers, that Aurangzeb cast this piece of ordnance when he captured Bijapúr: and on the faith of the journalist of his transactions in the Dekhan, translated by Scott, ‡ it has been asserted, but without being authenticated by other native writers, that he caused an inscription, in the name of Mahomed Adil Shah, to be erased, substituting another in its stead. The purport of the former

* This has been ascertained by Dr. Thomson. 'See Annals of Philosophy for September 1813 p. 208' to be an alloy of 80.427 parts of copper to 19.573 parts of tin. The instrument which is of tamborine shape, is used to announce the divisions of time by being struck with a mallet.

† Shirza signifies a lion or any other ravenous creature.

‡ Scott's Dekhan, vol. II. p. 72.

was to say that he obtained it from *Nizam Shah* by conquest, but it would appear, from the Búsatin-ús-súlatin, that it was obtained through fraud and not by force; and that, on the 10th of Moharram, in the year one thousand and forty-two of the Hej. * Agha Rizwan "delivered up the fort of Púrinda † to the king Mahomed Ghazy: at which time Morary Marah'ta, who had obtained command of that fort, brought the *Maidan* from thence to Bíjapúr." It had been cast by Rúmy Khan, a Turk in the service of the Nizam Shahy kings of Ahmédnagar, and was obtained from them in the manner above related; which fact is rendered sufficiently evident by the inscriptions now on the gun.

These are:—

لا اله الا الله ولا سواد

"*There is no god but God, and none besides him.*"

ابوالغازي نظام شاه بادشاه خاد م اهل بيت رسول الله وهي سنه ٩٥٦

Abul-ghazi Nizam Shah, king, servant of the race of the Apostle (Mohammed), and of the house of God. 956."

عمل محمد بن حسن رومي

"*Fecit Mohammed Ben Hasan Rumi.*"

شاه عالمگير غازي پادشاه دين پناه
انکه داد عدل داد وملک شاهان را گرفت
فتح بيجاپور کردو بهر تاريخ ظفر رونمود اقبال وگفتا ملک ميدان را گرفت
في سنه ٣٠ جلوس وا لامطابق سنه هجري ١٠٩٧

* This date corresponds with the 19th July, O. S. A. D. 1632. It has been placed by Grant Duff in A. D. 1636, but the complicated method of reckoning followed by Mahomedan historians, in dating their facts from the personal era of the prince, and then adapting them to the years of the Hejirah, has occasioned great confusion and inaccuracy in their details; and most of our English writers, yet further reducing the dates to the years of the Christian era, and only specifying generally the beginning of the Hejirah years corresponding to ours, have perpetuated the evil of anachronisms which are but too apparent in our Indian histories. In a future note, under the head of Aurangzeb's transactions before Bíjapúr, I will endeavour to clear up the history of this time.

† This is an old Fort, on the eastern bank of the river *Sena*, about 70 or 80 miles from Ahmednagar.

Shah Alumgir Ghazy, the asylum of religion, who granted the claims of the just, took possession of a kingly country and conquered Bíjapúr. For the date of the conquest good fortune came and said "he subdued the master of the field." *

In the thirtieth year of his exalted reign, corresponding to the one thousand and ninety-seventh year of the Hejirah.

The 30th year of his reign † corresponds to Hej. 1097, A. D. 1685. The last words give the numerals Hej. 1096 A. D. 1684-5, being one year less than the true date of the capture. The inscription is written in Toghra character.

Buildings of the Suburbs.

The ruins on the west of the city wall stretch from thence as far as the village of Torgha; and part of them was called *Naorispúr*, as already mentioned. The communication between these and the interior is chiefly through two entrances on that side; one named the Mekka, and the other the Shahpúr gate. The latter, situated north-wards from the

* Instead of reading ملک میدان (Maliki Maidan) it is sometimes read ملک میدان (Mulki Maidan) with the word کنندۂ understood, which would materially change the sense of this passage. I prefer the former reading of the text.

† The 29th year of Aurangzeb's *Jalus*, or reign, reckoning from the victory over his brother Dara Sheko, and adapted to the years of the Hejirah, terminated the 17th November O. S. A. D. 1685; and Bíjapúr had submitted about three weeks before; so that the inscription, having been subsequently executed, is dated the 30th year, or Hej. 1097, which commenced on the 18th of November 1685. If it be assumed that Aurangzeb dated his personal era, without adapting it to the years of the Hejirah, and from the period of his victory over Dara and subsequent ascension to the throne at Methora, events that happened on the 8th and 15th of June 1656, (see Catrou, who wrote from the evidence of an eye witness M. Manouchi,) then indeed the 30th year of his reign had commenced, when he took Bíjapúr, but may not be reconciled to be the year of the Hej. 1097, as such would fall within the year Hej. 1096, or the latter part of A. D. 1685. Nor may these contradictions be obviated by dating the commencement of the reign, from Hej. 1068, when he was again crowned at Delhi A. D. 1657, and the whole is an evident error arising from the loose mode of reckoning the year of the *Jalus* and those of the Hejirah.

other, leads through a still well inhabited bazar, which was first peopled by the orders of Ali Adil Shah 1st, when in Hej. 965 A. D. 1556 he was crowned there. The other principal ones, leading from within, are the Bahmany, Alawal, and Fattah Darwazeh. The last, which is on the south side, and on the road to the village of Monguly, is that by which Aurangzeb entered Bíjapúr. It therefore received its present name, the gate of conquest.

The suburbs were divided formerly into different *Púrahs*, or quarters. Those now known are the Shah Púrah, near the gate of that name; the Yakut Púrah close by, and the Zohrah to the southward of both, sometimes named Ibrahim Púrah, from being in the neighbourhood of the Ibrahim Roza, or mausoleum of Ibrahim Adil Shah II. This tomb is decidedly the most chaste in design, and classical in execution of all the works which the Bíjapúr sovereigns have left behind them; and is distant about three hundred yards from the Mekka gate. On the north side, where we enter by an elevated gateway, the exterior of the inclosure presents a handsome front of eleven small hollow arches, and in its interior side there are numerous small cells intended as a caravanserai or place of lodging for travellers.

The building itself is situated on an elevated platform, on the west of which there is a mosque. It has a tasteful colonnade of seven arches, on each of its four sides, forming a verandah of 15 feet broad round the whole interior; to this there is a slightly elevated pavement and second verandah, the roof of which is beautifully carved, and the work displayed to advantage by being finished with a handsome cornice. The dome rising above the whole, surmounted by a brass crescent, is in much better taste and proportion to the rest of the building, than in any of the others before described; and is in keeping with the four slender minarets at the corners, which consist of four stories including the cupola. The whole body of the mausolemn is elaborately carved in Toghra letters, embodying extracts from the Koran; and which were formerly gilded and enamelled, as were all the other inscriptions in the city. Ibrahim Adil Shah II. and fifth of the dynasty, lies interred here, along with his wife *Taji Sultan*, otherwise named Taj Jehan Begam, who was the daughter of Saiyad Abd-ur Rehman, and mother of Mahomed Adil Shah, the sixth of his race. It would appear from the following inscription, written in Toghra character, over the northern door, that it was originally intended for the mausoleum of this lady.

و رعجب ماند آسمان از ارتفاع این بنا سر برآورا ز زمین شد گومگرچرخي جدا
روضئه فردوس زین روضهٔ طرا وت برده وام
هرستونش در لطافت سروي ا زباغ صفا
بهرتاریخش صلا داده ملک زاو ج فلک یادگار تاج سلطان این بنأي دلفزا

Heaven stood astonished at the elevation of this building, and it might be said that when its head rose from the earth, another heaven was produced. The garden of Paradise has borrowed its beauty from this garden, and every pillar here is graceful as the cypress tree in the garden of purity. An Angel from heaven above announced the date of the structure by saying, " This building, which makes the heart glad, is the memorial of Taji Sultan." The last words give the numerals Hej. 1036 *A. D.* 1626.

The next inscription, which is over the southern door, is her eulogium.

زبیدهٔ خشمت وبالقیس رفعت ازو زیبا سریرو تاج عفت
چوزین منزلگه خاکی غبرا بدار الملک جنت کرد رحلت
چوپرسیدم زپیرعقل تا ریخ بگفتا تاج سلطان اهل جنت

In pomp like Zôbaida, * *and in magnificence like Bilkis* † *she was the ornament of the throne and crown of chastity, and when she passed to the capital of Paradise from this terrestrial abode, which is but dust, when I asked an old man the date thereof he answered me saying, " Taji Sultan is among the people of Paradise." The words give Hej.* 1043 *A. D.* 1633.

The following is on the same door:—

به حسن اهتمام این کار روضه ملک صندل رسانیدهٔ بپایان
بنا فرمودهٔ روضهٔ تاج سلطان که خلد اند رصفایش ما ند حیران
نمودهٔ چرخ ان یکنیم لک هون ولي نهصد وگرضم گشته با آن

Malik Sandal, by expending one hundred and fifty thousand huns, ‡ *with nine hundred more, caused this tomb to be finished after*

* The wife of the famous Khaliff Harun-oor-Rashid.

† The eastern name for the queen of Sheba.

‡ A hun is equal to three and a half rupees.

great exertion. It was erected, according to order, for Taji Sultan, at whose purity even Eden was astonished.

The mosque, which is on the same terrace with the tomb, is about one hundred and five feet long and sixty-six deep; presenting a front, on the east, of seven tasteful arches. In the open space between it and the tomb, there is a ruined fountain and reservoir.

In former times the *mambar* or pulpit, was surmounted by an ornamental representation of a mosque, regarding which an anecdote of Aurangzeb is mentioned, very characteristic of his extreme punctilio in matters of religion. The ornament was not thought orthodox; and having been removed by his order accordingly, part of it is now laid near the steps as you ascend from the area, or court, to the platform of the mosque.

The only remaining building in the suburbs to be noticed is the Idgah. It was built by Aurangzeb.

ART. II — *Continuation of Ehrenberg's Paper on the Coral Banks of the Red Sea, from page* 341.

Summary of our discoveries respecting Coral Animals as masses of rock.

(1.) The coral banks of the Red Sea are always found in shallow water: there, especially in the neighborhood of land, and in proportion as they approach land, both their number and extent increase. We met them in deep water only where evident signs of volcanic activity were seen in their neighborhood.

(2.) These coral reefs are never shaped like rings or funnels; they are always tabular, often elongated like tape, or in rows running parallel with the coast, with which they are evidently connected in a geological point of view.

(3.) The coasts of the Red Sea consist, on the Arabian side, sometimes of marl and gypsum, as near Hamam Firaun in the north, and near El Gisan in the south; sometimes of sandstone, as near Nakhus; or of the sandstone conglomerate of quartz and felspar with dolomite-cement, as near Ras Mohammed; seldom of lava as near El Wassem, in the south of

Gumfude; they often also consist of a tertier modern white and soft limestone; in horizontal strata, with diminutive, scarcely visible, fragments of fossil shells; which as inclined plains, often 15 to 20 miles broad, of considerable elevation, form the declivity, towards the sea, of the lofty porphyry, sienite, and silicious schistus mountains, that run through the length of Arabia, and very rarely approach the sea itself. The greater number of the flat islands, as well as of those which rise 300 feet above the surface of the sea, consist of a tertier modern very white limestone, which often resembles baked sand. Others again have high mountains, which consist of the abovementioned dolomitish conglomerate and of gypsum — not of marl and bergmehl, (Tiran,) or of lava, (Ketumbul,) and correspond with the mineral of the neighbouring coast, as is clearly proved by specimens I have brought with me. (*)

(4.) All coral banks, which could be examined, had for their basis a modern limestone in horizontal strata, which no where owes its existence to the sticking together and hardening of corals, or distinct fragments of them; for nothing of the kind is seen in them, but it consists almost wholly, of nearly microscopic, small, much dissolved organized fragments, or cemented sand, and sometimes appears to be evidently formed at an earlier period than the colonization of corals took place. This limestone may stand sometimes in the same relation to the corals as mould to the forest; but where it forms rocks, rising 100 to 300 feet, above the surface of the sea, without containing a single vestige of corals, either enclosed or lying upon it, there it is probable that it is older than the formation of corals.

(5.) Living as well as dead coral stocks form no where, in the Red Sea, high layers and rising one upon another; they give only the simple coating of most submarine rocks. The height of the coral stocks was often only 1 to 2 feet; no where, as far as could be ascertained, more than $1\frac{1}{2}$ fathom according to the magnitude of the several masses of rock. Thus it appears that the magnitude, generally ascribed to coral stocks by Ruoy and Gaimard, of 25 to 30 feet exceeds those of the Red Sea by double.

(*) The grains of the dolomitish conglomerate, of which, together with gypsum, consists the elevated island Tiran, which forms also mountains on the neighbouring coast, near Sherm el Sheik, not far from Ras Mohammed, are in the latter place covered with a thin black coating of manganese, wherefore the colour of the mountain near Ras Mohammed is black. Is this the spot which Burkhard considered volcanic? Moreover the mineral contains iron ore.

According to Forster there are a few coral stocks in the South Sea, which rise 3 fathoms above the surface of the water; this may serve as a scale for the possible height of such layers in the Southern Ocean.

Just as one forest does not continue to grow upon the other, even when the first trees die, and are left to themselves, or disappear in sand, as is the case with primeval forests, and as the vegetable earth is little when compared to the forest, just so appeared to me the natural relations of corals and their soil.

(6.) Only rocky soil was covered with a thick coating of corals, and we found no corals in sand, except a few paltry ones which were washed upon it by the waves. Magazines of live corals, which I had established on the sandy coast near Tor, died in a couple of days.

It is true we often found thin layers of a white sand, upon the coral reefs, between the several coral blocks; but the corals which were lying upon them loose were not many. It is likely they were broken off, either by the decay of their basis, or by the motion of the waves, or they were developed upon dead fragments. This sand is not stirred by the waves, and appears to be a slight precipitate of the sea water, after much agitation of great storms: it is perfectly harmless, because it is inconsiderable, and cannot easily be stirred up by the waves on account of the surrounding corals. Many *fungi*, Holothuri, and seafishes, are found in these places.

(7.) We noticed 110 different species of coral animals in the Red Sea; the number of all the various species, which are hitherto discovered there, amounts to 120, consequently nearly a third of all living coral animals of the earth which are accurately known *.

* (a) Respecting these various forms I have given, in a former treatise, on the coral animals, more accurate communications, and there I have endeavored to elicit, and to confirm, by the most particular examinations, the more general results communicated in the present paper. The whole family of the proper coral animals (with one mouth,) which were gradually divided into 158 different species, and had been mixed up with totally heterogeneous animals and plants, I reduced to 86 species, after a minute examination and comparison of their structure and developement; they might perhaps be reduced to less, if some species were made sub-species. Still I thought it more important to distinguish the families, where they represented a distinctly developed whole, than to endeavor to prove and show thoroughly the oneness of the principle of division. In a historical point of view, every where nature is not developed by the reason of man, but human reason is enlarged and unfolded by nature, whose foundation is deeper and stronger than all its systems. Thus it

(8.) Accurate observation of the peculiar structure of the several forms of coral animals, makes it evident that all those, that principally

appeared to me more correct, and more advantageous for science, not to sketch a logical scheme, and arrange under it the natural objects, whose groups, in that case, would fall asunder without any bond, in a later necessary alteration of that scheme, and would offer no firm basis for future investigation; but to form small groups of families, according to logical principles, which were arranged from several minutely examined forms, and which might afford a firmer basis for future systematic experiments. Thus the systematic view, which is given by me in their individual parts, is most accurate and to be depended upon; and the above divisions are mere characters taken *a potiori* of gradually larger and more comprehensive groups. They might be altered, in the progress of science, without the material, which they contain in themselves, falling to the ground being unsupported, as is the case if the Actinia are placed near the Echinoderma, and the Tethya, Spongi, et *cætera* near the corals, or the Cellepora and Millepora are united.

(b.) The segregation of limestone from coral animals is, where it forms something like regular leaves, small sticks, et *cætera*, a support of the muscular system with its sinews, and a separation of its vessels, just as in all other animals. Thus are the bones of men and mammalia, the broad shells of the multimuscular Bivalva and the Columella, together with the spiral shell of the unimuscular univalve, which is connected with it. Sometimes, but very rarely, it is a secretion of the system of the skin, as the scales of fish, without having any direct connection with muscles and sinews. The inner Lamella, which, in the cross-cut of the Actinia, form the rays, are evident long muscles with long fibres, which, in their position and relation to the body, perfectly correspond to the *stone lamella* of the stone corals, which are covered with thin fibrous skins, and consequently appear to give the supports of such musculous skins. — The axis of the Tsidea and Gorgonina stands in the same relation with the cover of the univalve snails, which, as Oken already observed, seems to contain the germs of the other half of the bivalve shells. In bivalves I am inclined to consider every simple thorough going muscle as two directly opposed to each other, which meet on account of their common vessels in the centre of the animal. I shall not further enter upon this field of speculation, which must be more cultivated, by farther direct observations of the particulars of the vessels; but I thought that, by placing together these resemblances, I could lead to some causal relations of the phenomena in the segregation of limestone, which it would be desirable still more accurately to examine and correct. Of course I cannot presume to predict, whether a more intimate knowledge of the process of the separation of limestone, may be more easily obtained by a more minute observation of it in mammalia, or whether the coral animals might not be preferable for this purpose. But as the greatest success may be expected, where necessarily the most intense attention is directed towards the minutest parts, I am inclined to believe that the coral animals, or shells, will solve the riddle sooner than the larger mammalia, which bewilder the observer.

form masses of stone, are quite incapable of erecting strong walls, in order to defend themselves against the breakers, as Forster imagined. The coral animals do not live in stone pipes, and do not build like termitæ [?] or wasps, a common house, or nest, (*) in order to protect themselves.

They are also not like oysters defended by stone covers; all genuine and influential stone corals have outwardly the soft animal body, and the dendritical or spherical stone-scaffold forms the inner bones, or the lower foot. In order, therefore, to erect walls for coral basins, a few species of the coral animals would be obliged to expose their homogeneous naked body to the whole force of the breakers; and, as it were, to sacrifice themselves for the rest. The homogeneous soft quality of the body leads us rather to infer, that the pernicious influences will also produce, in all, homogeneous effects. It is true the organ corals, on account of their stone *-epidermis*, live as it were in stone cases; but even these are not fond of great breakers, and are also more delicate and brittle than many others of inconsiderable size.

(9.) Conflicting opinions are found among travellers, that according to some, coral animals shun the breakers, according to others delight in them, or that certain forms are fond of them; and it is according to our observations that in general, living coral animals do not shun but love the breakers. In very calm basins we found more Tange, (sea weed,) than coral, but less beautiful and in less numerous forms than on lofty rocks and reefs; in protected sandy places we met with more sea weed: (their forms were similar to the *Zostera* and *Thucagrostis* of the European seas, but often peculiar, viz. the species of *Barkania*, not unlike the *Halophila* of the South Sea, and *Schizotheca Hemprichi*, a form quite peculiar to the Red Sea, with a large case divided into many parts containing generally four seeds; and with leaves resembling those of the *Thucagrostis*. Delile's singular *Zostera brillata* of the Red Sea is included in the *Barkania*).

We saw the largest and most beautiful corals always on the outer edge of the coral reefs, but they were rarely branchy, mostly *Daedalina*.

(*) It is true, Ellis, the first accurate observer, defends himself against Baster, by asserting that he has not imagined nests but skins; but the one comparison, as well as the other, does not apply to coral animals in general. It appears, in fact, that Ellis imagined the coral stock to be a Convolut of Serpula pipes, an arbitrary aggregate of many individual animals, among which also, oyster banks are to be reckoned. But the coral stock is something altogether different from these things.

Close to the perpendicular outer edge, which is quite flooded by breakers, we found branchy forms in greatest perfection; at a short distance from the outer edge, the specimens were much smaller.

Rocks that rise perpendicular, from the bottom, above the surface of the sea, on which the surge beats violently, have no coating of corals; but, however perpendicular they may rise from a great depth, all those that do not reach the surface of the water, and consequently allow the waves to break over them, are covered with corals. This latter circumstance no doubt must much diminish the intensity of the agitated water; but this appears by no means to inconvenience the coral animals, which seem on the contrary to like it, as it prevents the stagnation of decayed matter.

(10.) The coral animals are by no means soft, while in the water, or when young, and grow hard so they get older, or when exposed to the air; though there are some forms which are always soft, and never grow hard, and there are others which, on account of a certain inner formation of bone, are always hard and have never been soft, except in embryo. These two classes of coral animals resemble each other very much in their outward form, so that inexperienced people continually confound them. Still all hard corals, with the exception of the organ-coral, (a single genus of 86 genera, containing 3 of the whole 386 species,) have a soft coating, which alone properly speaking constitutes the animal itself, or at least its essential part. This soft, very thin, and jelly like animal body, which forms the coating of the stone corals, often extends itself to a great length, and shews feelers like threads and fringes, capable of withdrawing themselves, though sometimes these are wanting altogether. Further, this soft animal, which is variously organized, is capable of withdrawing itself into the starlike cavities of its inner scaffolding of bones, and may outwardly lie so close as to appear like a very thin, scarcely perceptible, slimy coating of the stone. Other forms are altogether without any stone kernel, but possess still greater capability of contracting and expanding themselves, so as often to excite admiration; and may, in regard to this strange and wonderful phenomenon, be called metamorphosis, although not in the strict sense of this word; consequently all accounts of the metamorphoses of corals are only erroneous or fabulous.

(11.) Living corals of the Red Sea do not exist at great depth. Already, in a depth of 6 fathoms, we found often not a single coral, though the less deep border of the island, or reefs close by, contained a great many. Also the pearl fishers of Yemen and Massava assured me, that

in a depth of 9 fathoms, there were no corals, in fact nothing but sand. We could not enter into more particular inquiries. It is true Ellis tells us that the *Greenlandish Umbellularia Encrinus* was caught in a depth of 236 fathoms, and where it is probable that it did not live alone. Repeated observations must show whether these whale-fishing accounts of Captain Adrian were not somewhat inaccurate.

(12.) The opinion of a natural dying off of whole generations of coral animals, at certain periods, in order to serve as a basis for fresh-developing generations, agrees no less with their physiological condition, and our experience, than the belief that they continue to grow when covered with sand, and that their growing one upon another is without the death of those that lie below. The latter is sometimes the case, but only with moss animals, and *Sertularina*.

(13.) It is evident that, perhaps with the exception of a few sands, the surface of the islands of the Red Sea is rather in a state of decay than of growth. We found no where, in the Red Sea, coral walls accumulated by the surge and resembling the sands in their existence, as said to be so common in the Indian Ocean.

(14. The coral animals, which encircle, like a garland, the submarine foot of the islands, appear to spread over them where wind and waves gradually diminish the smaller islands; and thus hinder their further decay, where such has taken place a little below the surface of the water. Thus the coral banks of the Red Sea rise not from the bottom till a little below the surface of the water, as generally believed of the coral reefs of the Indian Ocean; and all coral banks appear to have been small flat islands, whose upper parts were partly decayed, partly blown away, and at last flooded, till on account of corals gradually covering them in a single layer, like plants in sands, they preserved an almost equal height. If the foundation of these islands had been a hard *granite* or *gneiss*, in place of a soft modern limestone, which may often be called nothing else but sand cemented, and raised by volcanic agency, I have no doubt but that, in similar formations, they would, instead of forming submarine coral banks, have continued lofty rocks, which the farther such extend into the sea become more isolated, (as I had a short time ago an opportunity of observing to my surprise in the Norwegian rocks, which in their appearance wonderfully resemble those coral banks). Add to this the tabular shape of the coral banks of the Red Sea evidently appears to be the result of the horizontal stratification of their soft foundation, (the Norwegian rocks, which are not stra-

tified, but hard and indented, are merely rounded); on the other hand the numerous small funnel-like volcanoes of the South Sea appear, according to many existing observations, which agree in the main, to be the foundation of those coral rocks, and to have contributed to their circular shape.

If every gale of wind filled with sand the middle part of the circular coral reefs of the South Sea, most favorable to corals, the coral animals would die, like a forest overwhelmed with sand; but, from what I have observed, it does not appear consistent with the nature of coral animals to suppose that these middle parts are filled up by more than one layer of corals.

The corals never seemed to like places where sea water has been rendered muddy by loose sand; they always preferred places where the water was clear and transparent. And as far as I am aware there are no direct observations made, proving the existence of evidently preserved strata of corals being cemented and standing one on another, which, in undisturbed growth, at a former period have covered either a plain, or filled up a hollow place, and afterwards become accessible, by being raised through volcanic activity.

Thus it appears that the corals do not produce new islands but preserve them in a wonderful manner; and that they are ornaments to those already in existence, exhorting to caution, exciting admiration, affording instruction, and giving proof of much life and activity in the sea.

The sea may collect, in immense heaps, at its bottom, the earthy remains of sea animals, shells, pricks of sea urchins, serpula-pipes, coral stones, and small fragments of them, forming out of them sand and masses of rock, which are raised here and there by volcanic activity; while live corals may also comparatively speaking, occupy the first rank among animals which secrete limestone, and, in regard to this process, may be worthy of very particular attention, as they no doubt exercise to a very high degree, by indirect operation, that influence on the surface of the earth which excites our wonder and admiration in the formation of limestone. But according to what laws it is possible, that such small organized bodies, containing but very little limestone-earth, (according to Vogel about 0,02 percent.) should secrete such immense masses of carbonate of lime is a question not yet solved by the efforts which have been hitherto made.

Repeated researches in those regions may develope whether the low edges of craters, formerly higher than the numerous groups of small vol-

canoes in the South Sea, would not, without the covering of live corals, have been long ago entirely swept away by the sea; and whether the proper activity of volcanoes would occasionally not have filled up the middle basins, and, by after decay, rendered them fit for vegetative and animal life, but oftener left them, for ages, unfilled up, and quite at the disposal of corals to build upon.

On the additional knowledge of great organic life in the smallest space obtained by the improvement of the Microscope.

Already, in former lectures, I have endeavored to illustrate the organization of *Infusoria* as the smallest animals, and have expressed my conviction that these small moveable bodies, scarcely visible to the naked eye, or quite invisible, and which, up to the present time, people were inclined to consider as gradually decreasing in structure, though capable of organization, are in themselves nothing but matter either organized in the most simple manner, or altogether exempt from organization. These small bodies, I say, are distinctly and without any exception, very much complicated and organized.

These relations of organic life, proved to exist not only in *Rotatoria*, but also in all the principal forms of those that are designated, by Otto Frederic Mueller, *Animalcula Infusoria*, made it even necessary to divide these *Infusoria*, by thorough going physiological characters, into two distinct and separate classes, and in quite a different manner from what has been attempted by some Naturalists. I did not like to place a class of *Infusoria* in juxta position of a class of *Rotatoria*, but rather preferred to retain the term *Infusoria* in both lists of forms, distinguished by me on account of the similarity of their manner of living, both being observed in infusions. It is true the term Infusoria does not now appear to be suitable for either, but it is no doubt a convenient term for the whole, as Mueller found it, and nature pointed out.

The characters by which both classes of animals, formed of Mueller's Infusoria, have been organically distinguished, consisted according to my former observations of the following relations to each other: —

Rotatoria. (*Mueller's Trichoda, Vorticella, Brachiona, &c.*)	*Polygastrica.* (*Mueller's Trichoda, Vorticella, Kolpoda, Monada, &c.*)
1. Particular whirl organs, with-	1. No particular whirl organs,

out the whirl faculty in the rest of the body, or the simple rim of the mouth.

2. Simple gut with, or without, a stomach; always with a mouth, and a peculiar backside, sometimes with false guts, mostly with evident chewing apparatus, and teeth.

3. One to four red points on the forepart rather more or less.

4. Propagation only by distinctly large but not numerous eggs, with shells without self-division.

5. A complete, according to organic nature, possible and most probable, Gynandrismus.

and altogether exempt from the whirl faculty of the whole body, or of a few not farther distinguished spots, or of the simple rim of the mouth.

2. A gut divided into many stomach-like cells, without a peculiar backside, (i. e. many stomachs in the mouth without a gut,) or a gut covered with many stomachs, in the shape of bunches of grapes, with a mouth, and a peculiar backside, without any chewing apparatus.

3. Points rare, often wanting altogether.

4. Propagation by inner, very small, and numerous grains, (eggs?) and (sometimes threefold) self-division: viz. spontaneous length and cross division, and formation of blossoms.

5. No distinct Gynandrismus, still evident periodical formation of grains, in the inner part of all individuals, (eggs?) and their secretion (bringing forth) Anandrismus.

The above mentioned observations have made it, undoubtedly, most probable, that the organization of animal bodies, and in the direction of the smallest space, within the limits of human comprehensiveness, dwindles by no means quickly down to inorganic matter, as it has been hitherto generally thought; but demonstrates a very clear and distinct character, even in such small animal forms, which, on account of their diminutiveness, are perfectly invisible to the naked eye. I indulge the hope that a more recent observation, in which I have been eminently successful, will be particularly interesting at the present time, as it opens up a new circle of organs in the smallest animal forms, while it confirms the results which have been formerly come to.

Mr. Chevallier's microscope, which is very excellent, and which I have

hitherto used, afforded me, at 8 inches visual range, and without inconvenience, only a magnitude 245 times in diameter, which might be increased by elongation of the tube however; but it is inconvenient and renders observation fatiguing at an equal visual range of 380 times, or in measuring the objects in their true horizontal situation, i. e. at a longer visual range to the linear magnitude of 800 times. It then occurred to me that still stronger and more convenient magnitudes would lead to a more accurate knowledge of the physiology of the smallest organic bodies. I tried whether I could use, for these observations, the microscope of Mr. Ploessle of Vienna, which was lately purchased here by the Academy, and which is somewhat clearer than that of Chevallier's, and far excels it in magnifying power; but I found an invincible difficulty in the minute, almost evanescing, focal distance of the *lens* of the objects in its greatest magnitude, and in which I was particularly interested. Neither by small pieces of glass, nor of mica, could I make an imprint of very small objects; and it was quite impossible to observe through it *Infusoria* in water; because the *lens*, which touched the water drop, necessarily a little convex, attracted the water to the rim of its enclosure, and too flat uncovered small surfaces of water evaporated too rapidly. In consequence I made no fresh discoveries with the improved microscope of Ploessle which proved very useful in observing other objects.

At last on my repeatedly expressed desire of making such observations, and probably also at the request of other friends of this cause, the mechanic work-shop here of Mr. Pistor, well known by its scientific accuracy, offered under the personal direction of its Head, to make *achromatic microscopes*, on Selligue's principle of combining several object lenses, which is the same upon which the microscopes of Chevallier and Ploessle are made; and Mr. Shick, by his highly distinguished technical skill, succeeded, after accurate and attentive experiments, in producing a microscope, the first of its kind, according to certain rules of combining lenses calculated upon the refractory power of glass. I found this microscope of such excellence, that I was obliged to confess that, among all with which I was acquainted, this was the most suitable for the purpose of examining the smallest organic parts. In it regard was paid to a suggestion of mine that it would be necessary to make it of a convenient size, neither too small nor too large, with a local distance of at least near $\frac{1}{2}$ line, in its greatest magnifying power, (in order to be able to apply both pres-

sure and water upon the smallest bodies). The construction of the instrument being convenient and light, and for this reason not very expensive, several oculars, without an extension of the *tubus*, allowed a magnitude of little less than 1000 times in diameter at a visual distance of 8 inches; which, by the application of a still more powerful ocular glass, or *tubus*, or both together, might be more than doubled and extended so far, that the light, verging to obscurity, might still permit one to distinguish the adumbrations of small bodies. The terminus of twilight, in optic appearances, with the present apparatus, does not appear to exceed by much a linear magnitude of 3000 times, at least not to reach the double, whilst the terminus of light lies between 1000 — 2000 linear magnitude.

At the same time Mr. Shick made a more powerful ocular glass to fit my microscope of Chevallier; which, at the visual distance of 8 inches, and without extracting the *tubus*, increased its magnifying power to 525 times in diamater; but with extracted *tubus* and equal visual distance, to 800 times; when measured in the level of the objects, the linear magnitude of the microscope exceeded a thousand times.

The result of several experiments, made with this new optic power, on the smallest organized bodies, was as I have good reason to hope quite astonishing. By looking through this improved microscope, I discovered immediately, in the *Infusoria* which happened to lie near me, distinct indented organs of mastication, as in the mouth of the *Kolpoda Cucullus* of Miller, which is one of the most common small *Polygastrica*. This discovery was the more interesting as it formerly appeared that the *Polygastrica* possessed a certain greater simplicity in their organic formation than the *Rotatoria*, and the power of the system of nourishment, indicated by evident warts and teeth, was not a small argument for the more intensive organic formation of the *Rotatoria*, than of the *Polygastrica*. This notion has not only been removed by the discovery of teeth in *Kolpoda*, but in this respect the case is quite reversed, as there are now *Polygastrica* which possess several teeth, and consequently in one respect more developed organs of mastication than the *Rotatoria*. While the greatest number of teeth, observed in the *Rotatoria* is only 12, *Kolpoda Cucullus* has evidently 16 teeth, which are placed in the form of a hollow cone, growing narrower invertedly, or like a net, and form the entrance of the mouth. It may also be compared to an open *Mossperistom*. Thus also

in this respect, the above-mentioned character, which has been given to the whole class of these animals, is to be altered.

At the same time I found another result which was in similar respects interesting. I clearly discovered, even in very small Monades, as I have already mentioned in former communications, regular red spots which are never wanting in the forepart of many *Infusoria*, which are we have reason to believe eyes. The smallest Monades, which I have hitherto examined, had in their diameter a length of 1.92 of a Parisian line. With the aid of the new discovery of magnifying power, I immediately discovered two species in a new class of *Polygastrica*, of which the larger is only $50\frac{1}{2}$ lines in diameter, but the less not more than 1500, and consequently belongs to the smallest of all Monades, which can be observed, but which still evidently show the mark of such eyes. (*).

ART. III. — *The History of the Kalhora family of Sindh, descended from Abbas, the uncle of Mahomed the prophet, and commonly called Abbasides.* By the late Captain JAMES MCMURDO. *Presented by the Secretary.*

INTRODUCTORY NOTICE.

The posthumous papers of the late Captain McMurdo, hitherto published, will be found in the Journal of the Royal Asiatic Society of

* Other discoveries have been made quite recently. A large number of Polygastrica Infusoria have a mouth armed with 20 teeth. In Paramecium Aurelia, and also in many other species, I have discovered two large starlike and contractile organs in the inner part of the body, which again lead to a new circle of organs in Polygastrica Infusoria and in many Rotatoria; also in Hydatina I observe two inner rows of small finlike, tremulous organs, which were hitherto quite unknown; again I discovered, by stronger magnifying power, in Euglena Viridis and some other forms, a long proboscis (almost as long as the whole length of the body) which before I never could observe, because the magnifying power, which was then at my disposal, was not sufficient to make it appear. A more detailed account of these relations of organic life have been laid before the Academy, and forms a third paper, on the knowledge of organic life in the smallest space, with plates, which has been considered worthy by the Academy to be inserted in the next volume of their publications.

Thus it appears that these fresh discoveries confirm the opinion that the limit of the strongest organic life, in the direction of the smallest space, is both to be looked for, and to be admitted in much narrower spaces than could be hitherto observed by the human eye.

Great Britain and Ireland, and in the Bombay Geographical Transactions. Among the many subjects of interest, to which the energetic mind of this enterprizing and intelligent officer was early directed, none appear to have occupied more of its attention than the ancient and modern history of Sindh, embracing the resources and productions of the country, with the state of the river Indus. About the year 1812, and soon after our author had been appointed Agent for Kach affairs, he began to collect all the Persian books procurable on the history of Sindh; while several tracts, on the *parganahs* and towns of this province, and the different tribes of inhabitants, were expressly written for his information. Most of these Persian books and tracts, after Captain McMurdo's death, came into the possession of Mr. Norris, late chief Secretary at Bombay, who presented them to the present Editor: and as no authentic information, on the state of ancient Sindh, beyond what these contain, seems to be now procurable, it may be useful to enumerate the several works from which may be collected the history of Sindh. Captain McMurdo was sanguine, in his anticipations, that if the libraries and records of the families at Bhakkar were open to research, a considerable addition might be thereby made to our stock of knowledge on this subject. No good reason, for such expectations being ever realized, seems to exist; for, since the conquest of the country by the English, Captain Postans and others have vainly endeavoured to recover the last authorities, if indeed such were ever in existence. Those which have come down to us were chiefly compiled in the reign of *Akbar;* and among them, that most esteemed, is the *Tarikhi-Sindh* by *Mir Maasúm*, a native of *Bhakkar*, and the well known able associate of *Nizam-ad-din Ahmad Bakhshi;* who compiled the excellent general history of India, called the *Tabkat-i-Akbari*. On the subject of the ancient history of the province, and its early conquest by the *Mahomedans*, (A. D. 712,) *Mir Maasúm* borrowed from a book called the *Chach Namah*, written by *Ali-bin-Hamid* the son of *Abibikr* of *Kufa* in Arabia; and those following him have imitated his example, without adding to our information. Besides this history, used by Captain McMurdo in compiling his account of Sindh, there was another, quoted frequently, to which it seems he had been much indebted, namely the history called *Thofat-al-Ikram*. It was missing at his death and not found among his books; but since the conquest of Sindh, and consequent plunder of Hyderabad, the Editor has been fortu-

nate enough to obtain an excellent copy of this history, which appears to have belonged to the library of the *Amirs*. Should leisure admit, he intends at no distant time to present, in the pages of this journal, the ancient history of the country, during the period it was connected with, or ruled by, Bactrians, Parthians, and Indo-Scythians, connecting such with the age of the first Mahomedan invasion; where he will have recourse for information to the Persian works now mentioned, and to the papers of Captain McMurdo.

The portion of Sindhian history here given to the public is modern, and appears to have been in a great measure compiled from a book called *Wakeiati Sindh*, being an account of the family of Kalhora, who ruled the country previous to the rise of the *Amirs* of the Talpura family. It was written by a *Fakir* and relates the actions of *Miyan Mahomed Múrad Yab Khan*, otherwise entitled *Sirbúland Khan*, who and his other brothers, then struggling for power, were sons of the Kalhora, otherwise entitled *Khúda Yar Khan*, II. Its narrative commences with the year of Hejirah 1166, and month of Zelhijah, being the end of September and beginning of October A. D. 1753, at which time Sindh was invaded by *Ahmad Shah Abdalli*, king of Afghanistan: an account of which will be found in Mr. Elphinstone's Kabul. Any information on the site of Mansúra or statistics of Sindh, by officers now in the province, will be gratefully acknowledged by the the Asiatic Society.

JAMES BIRD, *Sec.*

Before pursuing the general history of Sindh, from the period when *Khúda-Yar-Khan* assumed the government of the province, it becomes necessary to trace the annals of the family from its origin; as it cannot but be interesting to know the events, which gradually led to the aggrandizement of the *Kalhoras*. It is to be regretted, that on this subject, the early *Mahomedan* writers have not left historical materials, sufficient to gratify curiosity; but the following pages contain all the incidents connected with the founders of the family, that I have been able to discover.

A descendant of Abbas, named *Miyan-Odhanna*, appears to have resided in *Mekran*, where he was held in great estimation for his virtuous and religious life; and, in a manner not uncommon in the annals of the *Mahomedan* faith, attracted numerous followers; some of whom from

igñorance, and others perhaps from less innocent motives, represented him in the light of a superior being. The adherents of the *Miyan* increasing, became in due time, a distinct body of men under the appellation of *Odhanna;* and were perhaps proprietors of land in *Mekran*. The temporal authority of the *Miyan* was handed down from father to son as an inheritance, which, in proportion as the branches of the family increased, became less valuable, and more open to litigation. It is accordingly ascertained that, in the fifth generation from *Miyan-Odhanna*, a descendant named *Gor Thall*, separating from the original stock, passed to the eastward, accompanied by a horde of followers, and established himself in *Kahirabela*, * upon the ruins of the *Gujar* tribe whom he expelled.

Gor Thall was succeeded in his rights and privileges, whatever they might have been, by his son *Bhill*, whose memory is still preserved in the fort of *Birlas*, and a celebrated mausoleum called the *Moti Makbirah*; both of which are works of considerable extent, and from which we may presume that this chieftain was vested with the civil government of a tract of country adjoining *Kahirabela*. On the death of *Gor*, the succession was disputed by several brothers. *Jhunia*, who is connected with the subject of this memoir, having attached to his person a numerous train of followers, resigned his claim; and penetrating still further east fixed his abode at the village of *Kambatha* where his holy descent and the celebrity of his ancestors procured him a reception among the *Odijah* † tribe. Here *Jhunia* married the daughter of a *Samma*, named *Dhera Pallah*, who was the independent chieftain of *Debal-Kangira*, a connexion which probably added to the influence of the holy man, and by which he had a son named *Mahomed*, from whom the sovereigns of the *Kalhora* dynasty derive their direct descent.

Kambatha.

Mahomed, who succeeded to the fortunes of his father and family, lived in the year 600 of the Hejirah, and the time when *Nasir-ad-din Kabachi* governed in the north of Sindh, and would seem to have acquired a greater degree of influence and repu-

A. H. 600.
A. D. 1204.

* At present the capital of a *Mekran* chieftain styled *Jam*. *Gujar Rajputs* are still known in Kach and Sindh; and there is besides a description of *Gujar* among *Mahomedans* in Kach.

† This tribe is still known in Sindh. They resided in the Sammawathee Parganah.

tation, than had yet been enjoyed by his family. Several tributary chieftains, noticed in the history of this period as powerful zemindars of the country, gave their daughters in marriage to *Mahomed*, who was thus introduced to the Court of *Multan*, where he was held in high respect, and received grants of land with other immunities in the *Bheralú* parganah, * adjoining that of *Lahiri*. Here he fixed his *Jhúnia* adherents in a town which he named *Jhúnabela*, but ultimately died and was interred at *Kambatha*. *Mahomed* left eighteen sons by different wives, all of whom had numerous progeny; and from the branches named *Daud* and *Lashar*, the two powerful tribes of *Daúd Pútra* and *Lashar* have their origin.

From this period the members of the *Jhunia* family appear to have sunk into comparative obscurity, and it was not until the ninth generation that it was revived in the person of *Adam Shah*, about the year 965 † of the Héjirah, from which date the fortune of the *Kalhoras*, rose by progressive steps, and in two hundred years elevated them from the prayer carpet to the throne.

A. H. 965.
A. D. 1558.
A. D. 1557.

Adam Shah found himself by inheritance the leader of a numerous sect of holy mendicants, established by his ancestors, and matured, in particular, by a religious fanatic named *Miran Mahomed Mehdi*, ‡ to whose patriarchal chair the subject of these pages was heir by a maternal claim. This sect resided in the *Chandúka* parganah, where in *Adam Shah's* time they were joined by the neighbouring tribes, who, enrolling themselves under the holy banners, surrendered, for the common benefit, a tract of land which they had before wrested from the *Chandoi* zemindars. In a few years the sect was so much extended that it became necessary to adopt some means of maintenance more adequate to their wants than the precarious and limited contributions of the charitable, or of the chiefs in the vicinity; and the first step to independence was the gift of the *Chan-*

Miyan Adam Shah.

* West of Bhakkar.

* This occupies a tract of country to the east of the Indus, where the *Sutlej* and *Attock* unite.

† 1*st Miyan Mahomed*, 2*d Miyan Ibrahim*, 3*d Miyan Shah Mahomed*, 4*th Miyan Rana*, 5*th Miyan Tahir*, 6*th Miyan Khan*, 7*th Miyan Sahib*, 8*th Miyan Gogar*, 9*th Miyan Shah*.

‡ See account of the *Mehdivis*; Bombay Transactions, Vol. II, page 28.

daka parganah to these mendicants by the *Khan Khanan*,* when he sought the *Shah's* blessing.

The Saints probably were sensible of the comforts attending worldly acquirements, and they devoted all their energies to extending their landed property. Whether with foresight of the future greatness of the family, or perhaps by a natural consequence of the effect of religion on uncultivated minds, the natives of Sindh, of all classes and descriptions, as if by common impulse, flocked to the beggars' standard, contributing their money, lands, or goods, to the wealth and importance of the general body. These advances to power were made at the expense of the surrounding Zemindars; who, naturally inimical to the further progress of such neighbours, excited the jealousy of the governor of *Multan*, and with the aid of his troops, the fakirs, as yet not hardened to warfare, were dispersed; and the venerable *Miyan-Adam-Shah* put to death.

A. H. 1000. A. D. 1592.

The *Shah* appears to have been confined in *Multan* for some time, and his adherents, like a proscribed race, sought refuge in remote parts of the country where they were unknown. When the *Miyan* was executed however, a friend in the capital conveyed his body to *Sakhar*,* where agreeably to his last request it was committed to the dust. The same friend, proceeding to the retirement of his family, drew them from privacy and established *Miyans Ibrahim* and *Daud*, the two sons of the deceased, in the chair of their father, whilst the re-assured *fakirs* rapidly assembled in their former dwellings. It is highly probable that the renovation of the sect was allowed by the government of the country, because the principal agent in the transaction was a civil officer of *Multan*; the chieftain of which perhaps regretted the death of *Adam-Shah*, although the peace of the province and the existence of the government might have been subverted, unless some such severe example had been made.

*Near Bhakkar.

Miyan Ibrahim and Daud.

Daud was succeeded by his son *Miyan-al-yas*, who died universally regretted; and his brother *Miyan Shah-Ali*, commonly called *Sahib Mahomed*, ascended the temporal throne of the family. Under this leader the *fakirs* not only increased in numbers, but, by his prudence and judgment, their resources were multiplied in proportion. The *Miyan* encouraged his followers to cultivate the sur-

Miyan-al-Yas.

* The Commander-in-chief of the Delhi army in the time of *Akbar Shah*.

rounding lands, and took a warm interest in every thing regarding this branch of Government. He was aware that landed property would tend much to preserve the influence which his flock already possessed in the country; whilst it would secure them the means of subsistence, under circumstances of adverse fortune. In pursuance of this policy a body of stout fakirs, having attacked the Zemindars of the *Abra* * and *Song* † tribes, deprived them of their rights, and having driven them from the country divided the land amongst themselves. The acquisition was followed by the cutting of the canal, known by the name of the *Larkhana Nalla*, a work executed by the industry of the sect who laid both banks under rich cultivation.

The Abra Chiefs, who were *Mahomedans*, having in vain endeavoured to recover their inheritance, had recourse to the *Moghal* governor of *Bhakkar*, who once more punished the fakirs and slew their leader. On this occasion, however, many actions were fought, in which the religious fanatics were sometimes successful; and, although ultimately defeated, they were inured to war and hardships, the benefit of which they afterwards experienced.

Miyan Shah Ali was slain, and succeeded by his son *Nasir Mahomed*, in the year 1068 of the Hejirah, under whom the sect assumed the character of a military bevey; and the famine and pestilence, which raged about this period in the province, perhaps facilitated the encroachments which they continued to make as opportunity offered. The Zemindars again appealed to the *Subahdar* of *Bhakkar*, who marching a force into the *Chanduka* district, compelled *Miyan Nasir* and his adherents to seek refuge in the sandy desert; where, being in want of every necessary of life, he ventured from his retirement and dwelt on the borders of the inhabited country. The *Moghal* government continued to threaten and overawe the fakirs. As the territory subject to the medicants yielded

Nasir Mahomed.
A. H. 1068.
A. D. 1658.

* A tribe originally inhabiting Sindh. It forms a member of the great *Samma* family. Some of the *Abras* became *Mahomedans*, whilst others adhered to the *Hindu* religion, and are met with in Kach. The district of *Abrasa* in the latter country derives its name from the chief Abras.

† This tribe I believe to be extinct. I have however met with individuals styling themselves Song. It was numerous before the *Mahomedan* conquest and a tract of country took its name from them. The *Song* are perhaps the *Asangi* of the ancients.

no public revenue, the government was of course averse to their re-establishment, and this dislike being in union with that of the *Bhumias* in general, a respectable army was detached to oppose the re-establishment of the fakirs.

A negociation was opened, and *Miyan Nasir* was induced to place his person in the power of the royal governor; who sent him prisoner to the Court of *Alamgir*, whilst the unfortunate fakirs, deprived of their Chief, were attacked, and after some resistance dispersed to places of concealment and security. In the mean time the *Kalhora* was a prisoner in *Hindustan;* in which state it is probable he would have spent the remainder of his life, had not fortune favored his escape; and which having effected he reached the residence of his family in safety. *Nasir* again led his followers into Sindh, and succeeded in establishing them as before; but having placed the former capital *Tehri* at the disposal of one of his trusty men, he founded the town of *Khari* in a strong natural position, in the Bhowar* district, where he in person fixed his abode.

* Sometimes written Bhowanir.

From this time, he successfully opposed the troops of *Bhakkar*, under the Subahdar in person; but the ambitious and aspiring disposition of the *Miyan* brought upon him the jealousy of all his neighbours; whose intrigues for his overthrow were, however, generally defeated by his foresight and prudence. Whilst he continued, in this manner, by force to extend his territorial possessions, he farmed the parganah of *Lakhawat* from the governor of *Sehwan*, which being followed by other acquisitions of a similar nature, the patriarchal authority began to assume the appearance of an organized government.

Miyan Nasir enjoyed the satisfaction of having founded, on a firm basis, the fortunes of his family; and after five or six years departed this life at an advanced age.

Miyán Dín Mahomed the son of *Nasir* succeeded his father; but advantage of the change being taken by the Zemindars of *Bhowanir*, whose capital *Fattahpúr*, had been occupied by the *Kalhoras*, the new chieftain found himself involved in a war before he was well seated in authority. The governor of *Sewi* led his troops to dislodge the fakirs, but after repeated defeat and disgrace, was superceded in command by an *Amír* named *Sheikh Jehan*, who was sent from India expressly to extirpate a sect, against which complaints

Miyan Din Mahomed.

were constantly submitted, to the great annoyance of the royal Court. *Sheikh Jehan*, though aided by the *Súbahdar* of *Bhakkar*, was still more unfortunate than his predecessor; for having advanced indiscreetly, his camp was surprised in the night, and his troops being dispersed, were pursued by the *Kalhoras*, who slew the *Sheikh*, and harassed the hasty retreat of *Allah-Yar-Khan* the governor of *Bhakkar*. This action occurred at the village of *Kurela*.

Not long subsequent to the foregoing event, a sudden and unexpected irruption was made by the force of *Kabz Khan Barrohi*, who gaining considerable advantages over the *Kalhoras*, the latter sought and effected an accommodation, and the *Barrohis* retired to Kelat. The *Bhowanir* tribe, in whose country the *Kalhoras* were settled, always uneasy under the yoke, and encouraged by the late disaster, rose in arms but were suppressed. The relict of their independence was subverted, and their lands entirely occupied by *Dín Mahomed*, who was preparing to decide a quarrel with the *Afghan* governor of *Shikarpur*, when he was arrested by intelligence of the approach of prince *Moaz-ad-dín* from *Multan* to revenge the death and defeat of *Sheikh Jehan*.

The *Kalhora*, who was not wanting in foresight, deputed his brother with a respectable mission to make his peace with the prince. This embassy was completely successful, and *Moaz-ad-dín* commenced his retreat, when a headstrong and ignorant fakir, supposing the forbearance of the prince to proceed from fear, made an irruption into the *Matilla* and *Ouch* districts, some villages of which he destroyed. This act, which was unauthorized by the *Miyán*, brought upon the whole sect the vengeance of the *Moghals;* who, countermarching, passed without opposition into their territory, and laid the capital *Khari* and other principal towns in ruins. *Dín Mahomed* had retired with his followers before the prince's arrival; and during the six months, which the latter spent in the neighbourhood, found means to procure a pardon, and surrendered himself in the royal camp.

Although the *Kalhora* had submitted his person and cause to the mercy of *Moaz-ad-dín*, his followers, led by his brother *Miyán-Yar-Mahomed*, persisted in opposing the royal arms. A force was detached against them, which was defeated in a desperate and bloody conflict on the banks of the river Roj.* The royalists on this occasion lost

* This is perhaps some obscure stream.

Raja Gaj Sing, by caste a *Bhattiá*, and *Raja Suráj Mal* of *Udhipúr*, two officers of high rank and estimation. The prince, probably contented with having laid waste the country, or perhaps unwilling to risk the reputation of his arms with so successful an enemy, retired with his court to *Multan*, where he placed *Miyán-Dín-Mahomed* in confinement, and ultimately put him to death.

Yar-Mahomed, unable to regain the lost territories of his family, led his adherents towards Kelat; where the *Barrohis* at first received them as enemies, and a battle ensued, in which the flower of both armies were slain; but an accommodation having been at length effected, the two sons of the *Míyán* were given in pledge for the peaceable behaviour of the emigrants, who were in return afforded an asylum. This arrangement took place in the year of the Hejirah 1111.

Míyán Yar Mahomed.

A. H. 1111
A. D. 1699

In A. H. 1113 *Miyán-Yar-Mahomed* was invited by the *Surye** chieftains to attempt the re-establishment of the family, an offer which was accepted by the *Miyán*, who having persuaded the *Barrohis* to second his efforts, joined his friends in the *Bhowanír* districts, with a reinforcement of that tribe. A camp was formed at the town of *Kakhan*, where the *Kalhora* with the heavy part of the equipment remained, until the *Suryes* conquered *Murgpur* and *Fattahpur* from the *Afghans*, when *Yar Mahomed* advanced to that quarter, whence he dismissed his *Barrohí* adherents. It is said, that the rapidity with which the natives of Sindh, (who are in general disciples of the *Kalhoras*) assembled round his standard, was truly surprising. Successes followed each other with such rapidity, that the *Miyán*, in a few months, was in possession of *Shikarpur*, (afterwards called *Khudabad*,) the capital of a vast tract of country in which he fixed his residence.

A. H. 1113
A. D. 1701

In the mean time the *Suryes* dispersed throughout the northern districts, several of which they forced the *Afghans* to resign; and their successes soon attracted the attention of *Moaz-ad-dín* who still governed in *Multan*. The governor of *Sewí*, in particular, represented the progress of the *Suryes* as extremely dangerous to that prince's authority and detrimental to the revenues of the province. The prince proposed

* *Surye* is the name of those Sindhians who resided in the district of *Sirra*, and who were most fervent in their attachment to the *Kalhoras*, whose consequent misfortunes and banishment they shared.

to march by a route which led through the *Afghan* territory, but being opposed by that tribe, he turned his arms from the original object, and having slain the *Afghan* governor, established his authority in *Sewi*.

Miyán-Yar-Mahomed, sensible of the folly of resisting so powerful an opponent, prudently deputed officers to the prince, and thus having made known the submission of their master, and his desire to become attached to the imperial government, the latter after some hesitation resolved by a regular Firmán to confer on the *Kalhora* the *Subahdari* of the districts which were known by the name of the *Deras*,* and the capital of which was Shikarpúr alias *Khudabad*. In order to be invested, it was considered necessary that *Yar-Mahomed* should proceed to court, and he had actually commenced his journey when he was met by the royal officers, who presented the *Firmán* (with the distinguished title of *Khuda Yar Khan*) on the part of the *Moghal* government.

We have hitherto seen this family alternately rising and falling to the two extremes of fortune; one day possessing extensive territorial wealth and reputation, and the next reduced to the necessity of seeking the protection and aid of the neighbouring chieftains. Although *Miyán Nasír* and his successor had bravely struggled to secure independence and power, their views were constantly thwarted from the circumstances of their object not only being unauthorized by the supreme government of the country, but directly adverse to its interests. The period had however now arrived, when the *Kalhoras* were enrolled among the royal officers, and in virtue of that situation their authority became legitimate; and henceforward therefore they will be found to rise rapidly both in dignity and stability.

Khuda Yar Khan, uneasy at being surrounded by *Moghal* officers commanding in separate districts, privately revolved in his mind a plan to extend his authority. The *Dera* of *Sewí* was held by an officer named *Ghazí-Khan* †, who was by no means a favorite of the supreme government, but which was perhaps not in a condition to enforce implicit obedience. The *Kalhora* deputed a *Baluchi* to *Multan*, where he procured a Firmán for *Sewi*, which district he occupied after consider-

* This word I believe signifies a district town or even a house or tent in Sindh; it seems generally to mean a town or district. *Derah* or *Dera* is a word common all over *Afghanistan*.

† The capital of his district is sometimes named the *Dera* of *Ghazi-Khan*.

able difficulty. The two young *Sahib-Zadahs*, who had been left in hostage at Kelat, now joined their father at *Khùdabad*, whence one of them was ordered to assume the management of *Sewi*.

The property of the government and the popularity of the *Kalhora* chiefs continued to increase. About the year of the Hejirah 1123, when *Nawab Shakar Khan* quitted the province of Sindh, *Khúda-Yar-Khan* farmed the parganah of *Rúpah*, and otherwise extended his rule by his success against the *Daud Putras*; a tribe, the origin and progress of which, had been similar to that of the *Kalhoras*, to which it was at the time not inferior in any respect. A lapse of nine years now occurred without producing any event of importance in the annals of the family. The *Jagir* enjoyed a happy and beneficial tranquillity, which was only partially disturbed by a war with the *Jhokia* tribe of Zemindars, and which having been brought to a successful conclusion, *Khúda-Yar-Khan* departed this life after a reign of eighteen years, distinguished no less for activity and prudence than by the signal success with which those were ultimately crowned.

A. H. 1123. A. D. 1711.

On the death of their father his two sons *Núr Mahomed* and *Daúd Khan* struggled for the succession. In the life time of *Khuda-Yar-Khan* these *Sahib Zadahs* had imbibed a jealousy of each other, which was founded and matured by the imprudence of the parent evincing an affection for one of them in particular. This unnatural contest continued for three years, when *Daud Khan* threw himself on the mercy of his brother, who secured to him an ample and honorable provision.

Núr Mahomed was not unmindful of the necessity of having his claim acknowledged by the Emperor, and succeeded so effectually, that, before the termination of the civil strife, he had procured from *Mahomed Shah* the title of *Khúda-Yar-Khan*, and renewal of all the sannads held by his father. Some lands and villages had been illegally occupied by the *Daúd Pútras*, and this tribe refusing to surrender the territory alluded to, the *Kalhora*, under the authority of *Mahomed Shah*, attacked and subdued them. The lands were divided into four parts, two of which went to the original *Jagirdar*, one to the *Daúd pútras*, whilst the 4th and valuable division, bordering on his own districts, was retained by the *Kalhora*.

In the year 1139, *Khúda-Yar-Khan* detached a force once more against the *Daúd Pútras*, and succeeded in shutting up the families and proper-

ty of that tribe in *Derbela*; to which place he laid siege and would finally have reduced the garrison to surrender, had not the *Saiyads* of the country interfered and concluded an adjustment of the dispute, by which the district of *Nhar*, which had before been occupied by the *Daúd Pútras* was transferred to the *Kalhora*. The cession of the tract in question, opened a free passage into the province of *Múltan*, through many parganahs over which *Khúda-Yar-Khan*, in the two succeeding years, established his authority. Sehwan and its dependencies had about the same time been included in the *Jagir* through the kindness of the Emperor *Mahomed Shah*, who was peculiarly favorable to the interests of this enterprizing family.

The western frontier was proportionally extended, and a variety of Chieftains and Zemindars reduced, the names of whom, and that of their possessions, as they are obscure and almost unknown in the general history of Sindh, I have considered it proper to omit. As sufficiently descriptive of the high place assumed by *Khúda-Yar-Khan*, it may be observed, that about the year now spoken of, with exception of *Bhakkar*, his control embraced the countries from the borders of *Múltan* to those of *Thatta*. In an eastern direction, it was bounded by the desert, whilst it extended over the *Balúchi* mountains westward; bordering on the dominion of the Kelat *Barrohis*, whose jealously being excited led to a war, in which much blood was shed.

Some acts of violence on the part of *Mir Abdúllah Khan Barrohi*, (who according to a historian, entitled himself the eagle of the mountains,) probably committed in revenge for the attacks of the *Kalhoras* on *Balúchistan*, which was originally subject to *Kelat*, induced *Khúda-Yar-Khan* to take the field in person. The first fruit of the expedition was the conquest of *Kirta*; a strong fort whence the *Kalhora* detached his troops into the *Kelat* territory, defeating those of that nation and slaying *Kakar Barrohi*, a relation of the chieftain. The same year peace was concluded, in which it was stipulated that the two *Sahib Zadahs*, sons of *Khúda-Yar-Khan*, should be allied to daughters of the *Barrohi* family, a circumstance which shews the ascendancy of the *Kalhoras*.

The ensuing year was distinguished by the bad faith of the *Barrohis*, who, unmindful of their recent engagements, made a sudden and destructive irruption into the neighbourhood of Faridabad. *Khuda-Yar-*

Khan moved to *Larkhana*, whence he detached a select body of Sindhians under officers of reputation, to oppose *Abdúllah Khan*, who had encamped his forces at the village of *Chanderi*. An action was here fought, in which the *Barrohis* were utterly routed, and their chieftain slain. An adjustment was ultimately effected, and guaranteed by the marriages of the *Sahib Zadahs* with ladies of the *Barrohi* family.

In the year 1149 A. H. the fortress of *Bhakkar* and its dependencies were delivered over to *Khúda-Yar-Khan*, who the following year was regularly invested with the government of the *Súbah* of *Thatta*; which capital, as has already been related, was surrendered to the *Kalhora* by *Nawab Sadik Kúli Khan*.

The *Kalhora* dynasty has thus been traced from the prayer carpet and head of a sect of mendicant itinerants to the sovereignty of Sindh. They were indebted for the rapid success which latterly marked their career, to the weakness of the Delhi government; which, under *Mahomed Shah*, was totally incapable of aiding, or supporting its officers in the distant provinces, of which perhaps Sindh was the most fickle. Rumours were at this time prevalent that *Nadir Shah* had in view the conquest of India; and it seems not improbable that, from the partiality expressed by *Mahomed Shah* for *Khúda-Yar-Khan*, he had in view the attachment to his person of a family, which, from the paramount influence it possessed throughout Sindh, was better calculated to consolidate and employ resources in his defence, than his Indian officers, to whom the people were strangers both in language and manners. Such were the chief springs of the *Kalhora* fortunes, although much must doubtless be attributed to the veneration in which the the family was held on account of its holy descent. These religious opinions tending to awe the public mind, in conjunction with worldly power, produced a singular and evident effect on the government and general features of the province.

A. H. 1151. A. D. 1738.

This new era of the Sindhian annals, as it may with propriety be styled, occurred at the moment when *Nadir Shah* threatened the eastern *Moghal* empire, about the time when the mighty storm, which, after lowering for two or three years, at length poured with resistless fury on the unfortunate throne of *Delhi*. The accession of the conqueror, to the throne of Persia, whose vast resources and ambitious mind had for some years been a subject of uneasiness to all the surrounding govern-

ments, having attracted from the first the attention of *Khúda-Yar-Khan*; he had assiduously courted the favor of *Nadir Shah* by regular and flat-
A. H. 1151. A. D. 1738. tering correspondence. On the investing and subsequent reduction of *Kandahar*, it was reported that a body of Persian troops would enter Sindh, on the projected invasion of *Hindústan;* to meet any exigence that might occur, and for the security of his frontier, the *Kalhora* remained in *Larkhana*, whilst he intrusted the newly acquired *Súbah* of *Thatta* to the management of his son *Mahomed Múrad Yab Khan*, who assumed his charge late in this year.

In the Delta of the Indus, and near the sea shore, two Chieftains still enjoyed independence; namely the *Jam* of *Kakralla*, a branch of the *Samma* family, and *Rana Ajmal* of *Dharaja*, by caste a Najamra and descendant of a family, which had preserved its inheritance through the many vicissitudes to which the province of Sindh had been subject for several centuries. These Chieftains had the command of the principal branches of the river Indus, in which their vessels exercised unlimited authority, and levied revenues arising from the trade passing up the streams. Whether the desire of adding to the revenue of the province, or, as is affirmed by some authors, to punish some acts of aggression which had been committed by the boats on the river, led to the attack of these Chieftains, is not very clear; but the *Sahib Zadahs* had hardly reached *Thatta* when they declared war with the *Kakralla* and *Dharaja* Chiefs.

The honour of his arms was at first tarnished by defeat; and the fleet of the enemy, sailing up the river, burnt and laid waste both shores as high as *Thatta* and *Nasirpúr*. On the Sindhian army preparing to penetrate into the Delta the expedition was suddenly postponed, and *Múrad-Yab-Khan* recalled to aid the arrangements of his father. *Nadir Shah* was now making rapid strides to conquest, while engaged in the expedition which placed the empire of India at his disposal. When *Khúda-Yar-Khan* heard of the cession by *Mahomed Shah* of all the countries to the west of the river *Attock*, including the *Deras* or division of *Shikarpúr*, *Bhakkar*, *Sewistan*, *Nasirpúr*, the *Suhah* of *Thatta*, and all which in fact composed the *Kalhoras* dominion, he was overwhelmed with terror; and, having despatched his family and property to *Tehlar*, deserted his country, and took refuge in *Amerkot* (a fortress situ-

ated in the desert,) although the conqueror is said to have encouraged him to visit his presence by kind assurances of honour and protection.

Nadir Shah appeared before *Amerkot*, and compelled the fugitive to surrender his person. He was carried prisoner to *Larkhana*, where the *Shah* was pleased to reinstate him in his dominions, on consideration of his paying a fine of one crore of rupees. His Majesty however deprived the *Kalhoras* of *Shikarpúr* and *Sewí;* the former of which he restored to the *Daúd Putras*, and the latter to the *Afghans*, whose possession it originally was; and having in this manner settled the affairs of Sindh, *Nadir Shah* commenced his return from *Larkhana* on the 11th Moharam 1153 A. H. carrying in his train the two *Sahib Zadahs Mahomed Murad Yab Khan*, and *Ghulam Shah Khan*, as hostages for an annual tribute of twenty laks of rupees, which he imposed on the province; and in return for which acknowledgement, he bestowed on the *Kalhora* the title of *Shah Kuli Khan.*

Shah Kuli Khan.

During the stay of *Nadir Shah* on the frontier, the Persians had dispersed throughout the country; and, by their lawless and disorderly conduct, encouraged many of the mountainous tribes to commit excesses on the fertile and populous plains. To check this disposition and to punish the banditti, engaged the primary attention of *Shah-Kuli-Khan;* who, appointing *Sultan Samuttia* to the government of *Thatta*, instructed that officer to inflict a salutary chastisement, in the first place, on the Shora tribe of *Baluchis* of *Miyaní*, who had been foremost in the disturbances. Success attended the arms of *Sultan Samuttia*, who now directed them against the various troublesome tribes residing in the *Wangah* parganah, * subject to *Kachgaum* situated east from the capital.

An army of *Thamas Kuli Khan* approached the boarders of Sindh, ostensibly to punish the *Daúd Putras;* but the *Kalhora* taking the alarm retired to a place of security, having previously recalled his officers from their respective districts. A considerable interval now elapsed, during which there existed no government in the province, so that a system of anarchy and confusion spread through the country to its utter ruin. *Shah Kuli Khan* was at length once more induced to confide in the royal officers; and proceeding to the camp, was permitted to resume his authority, on leaving his third son *Attar Khan* an hostage.

A. H. 1156. A. D. 1743.

* These tribes are *Tamachi*, *Togachi*, *Jhara*, *Sula*, *Ktsta*, and *Asow Sumrah.*

The Officer commanding in *Thatta* led a force to the southward, and
A. H. 1157. attacked *Jam Hothi* the chief of *Kakralla*, who, being
A. D. 1744. slain, was succeeded by his relation *Jam Mohar* a protegé of the *Kalhora* family. The following year *Shah Kuli Khan*, in per-
A. H. 1158 son, conquered the fort of *Sanchi* which was situated in
A. D. 1745. the division called little *Kach*, and on the route to the larger province of that name. The latter government, taking offence
A. H. 1159. at this attack, carried on a predatory warfare until it was
A. D. 1746. chastised in 1159 A. H.

The conduct of *Rana Ajmal* of *Dharaja*, during the confusion consequent to *Nadir Shah's* invasion, had been such as to draw upon him the wrath of the superior Government, but the *Kalhora*, in person residing in the northern frontier, had hitherto been unable to detach a force
A. H. 1160. sufficient to call him to an account. In A. H. 1160,
A. D. 1747. however, the Rana, encouraged by the impunity which had hitherto attended his conduct, instigated some of the mountain banditti to join in an irruption which he made to the gates of *Thatta*; the government of which suffered a disgraceful defeat, under the walls of the capital. An act so bold and insolent called for immediate notice, and *Shah Kuli Khan*, having accordingly removed the authorities of *Thatta*, directed his son *Khuda Dad Khan* to proceed with a select force to subdue the *Dharaja* chieftains.

The *Sahib Zadhas* besieged *Dharaja*, which was naturally a place of some strength, and defended by skilful officers on the part of *Ajmal*, who had in person embarked with his fleet. The capital having, at length, been reduced, the Rana was persuaded to land for the purpose of negociation, when he was treacherously slain by a *Jokia Baluchi*, employed for the purpose, and the *Kalhora* authority established throughout his districts.

The death of *Nadir Shah* and the conquest of *Kandahar* by *Ahmad-*
A. H. 1161. *Shah-Saddozi*, who founded the government of the *Dura-*
A. D. 1748. *nies*, rendered the province of Sindh tributary to *Kandahar*. *Ahmad Shah* bestowed on the *Kalhora* the new title of *Shah Nowaz Khan* which superseded that given by *Nadir Shah*.

In 1162 Hej: the *Sahib Zadhas*, *Ghulam Shah Khan* and *Attar*
A. H. 1162. *Khan* returned from Persia; and the following year ves-
A. D. 1749. sels were dispatched to bring home the other son *Murad*

Yab Khan, who had proceeded from Persia to *Mekka*, where he em-
A. H. 1164. barked and joined his family in A. H. 1164. During the
A. D. 1751. absence of the *Sahib Zadhas*, in Persia, a brother named *Khuda Dad Khan*, who had been the executive officer under his father *Khuda Yar Khan*, now however assumed an active part in the government; and was intrusted, by his parent, with the exclusive charge of the public business; which exciting the jealousy of the *Sahib Zadhas*, *Khuda Dad Khan* quitted *Sindh* and retired to India.

The king of *Kandahar*, who in Hej: 1167 had failed in an attempt to subdue the empire of Hindustan, advanced at the close of that expedi-
A. H. 1167. tion to *Sevistan*, for the purpose of enforcing the pay-
A. D. 1754. ment of the Sindh tribute, which had been but partially realized during the recent employment of his army. *Shah Nowaz Khan* fled, and found an asylum in *Jesilmír* where he departed this life.

Mahomed Murad Yab Khan, fearful that his father might pledge his person as an hostage, as he had before done, fled to *Amerkot;* where, on the demise of *Shah Nowaz Khan* he was declared, by the Chief of the *Suryes*, to be the legal successor to the government. Previous to this event, the *Kalhora* vakeels had been sent to the royal camp; and, by unqualified submission, had satisfied his Majesty. This instance of disrespect, however, induced the King to retract what he had promised, and to send a force into *Sindh*, for the purpose of overturning the self-created sovereign *Murad Yab Khan*, who afraid to leave his asylum in the desert, saw the country occupied by *Kandahar* officers; and as the last and only resource deputed persons to the camp, where having made known the submission of the *Kalhora* and his acknowledgement of dependence, His Majesty, happy perhaps to bring affairs to a conclusion,
Murad Yab Khan entitled Sirbuland Khan. carried away *Sahib Zadha Attar Khan* in hostage, and confirmed *Murad Yab Khan*, in the rank and power of his father, with the title of *Sirbuland Khan*.

This Chieftain fixed a camp on a pleasant spot, near *Nasirpur*, where he founded the city of *Muradabad*. The first act of his government was to attack *Jam Hajaji*, the existing chieftain of *Kakralla*, who defended himself bravely; but, overcome by numbers, was compelled to cede the greater part of his possessions, a strong hold of which called *Kach* was fortified by *Sirbúland Khan* as a safe retreat in cases of danger.

Sirbúland Khan had now been upwards of three years chief of the *Kalhoras*, when he evinced a disposition to oppress his subjects, and slight the *Surye* officers. But perceiving at length, that his conduct had lost him the affection of his people, and fearful lest the King should send an army against him, he formed the resolution of quitting the country; as a primary step to which he embarked his treasure and valuables for *Muscat*, whither he prepared to follow, as soon as he should have completed the plunder of the country. In defiance of his recent engagements with the Jam of *Kakralla*, he attacked the territories which he had two years before guaranteed; a proceeding that drew upon him the ill will of the *Surye* chieftains, who had been agents in making the arrangements with the Jam. These officers induced *Miyan Ghulam Shah* to dethrone his brother, who was accordingly seized together with his family, and his authority assumed by the former.

13 Zilhija 1170 A. H. 29th August, 1757.

Ghulam Shah was raised to the sovereignty whilst in the south of Sindh, and was compelled, for some time to confine himself to that quarter, in consequence of the opposition of his brother *Ahmad Yar Khan*, who in *Khudabad* refused to acknowledge his authority. In the mean time *Attar Khan*, a brother older than *Ghulam Shah*, who was then a hostage at *Kandahar*, hearing of the confinement of *Murad Yab Khan*, applied for and procured a firmán, from the King, appointing him to the government of Sindh; which province he entered with a body of *Afghan* allies, and was joined by some levies under his brother *Ahmad Yar Khan*. The officers and chieftain could not be induced to oppose the royal seal, and *Ghulam Shah* being deserted by them retired to the desert; where the further defection of his adherents, and the escape of the dethroned *Murad Yab Khan* compelled him to prosecute his journey to *Jhodpúr*.

Miyan Ghulam Shah.

A. H. 1171. A. D. 1758.

Attar Khan now assumed the government, and, contrary to the expectations of the people, confined his brother *Murad Yab Khan* in *Khudabad*. In return for its support, the Afghan Court had been largely promised by *Attar Khan*, and a system of plunder and extortion now ensued to satisfy their demands. A few months however had scarcely elapsed, before the province was suddenly invaded by *Ghulam Shah*, who advancing from India left his son *Sar-*

Mahomed Attar Khan.

fúraz Khan and the heavy baggage in Debalpur, and attacked his brother's forces in the environs of *Lohri*. During his abode in India, he had solicited and obtained aid from the *Rajput Rajás;* and although his numbers were inconsiderable, his attack was so successful, that the two brothers fled to *Kandahar*, leaving him in full possession of Sindh without another struggle.

A. H. 1171. A. D. 1758.

Early in the year 1172 H: *Attar Khan* and *Ahmad Yar Khan* having laid their complaint before the King succeeded in procuring a new firmán for the province, and *Ahmad Shah*, in order to insure proper respect to his authority, furnished the elder brother with a contingent of troops, with which he invaded Sindb, leaving *Ahmad Yar Khan* in Kandahar. *Ghulam Shah*, dubious of the result of the contest, retired to the fort of Kach, in the *Kakralla* districts, from the Jam of which he met with a kind and hospitable reception. The fort of Kach has been already mentioned as a place of great strength, chiefly arising from the nature of the country. Hither the population of Ounenga bunder had been transported and a new seaport formed under the name of *Shahghar*. In this retreat the family of *Ghulam Shah* remained under the protection of *Jam Hajáji*, whilst the former led his adherents to oppose the Afghans; who, under the command of his brother, had advanced to *Chachgaum* plundering and devastating the province. The dispute was about to be decided by the sword, when a negociation was entered on, which placed *Ghulam Shah* in possession of one-third of the country; the rest being secured to the other brother. *Shahghar* and *Thatta* to the borders of *Nasirpur* fell to *Ghulam Shah's* share, whilst *Attar Khan* occupied the rest of Sindh.

Miyan Ghulam Shah. A. D. 1799. A. H. 1172

Ahmad Yar Khan, who had been left at Kandahar, perceiving the turn which affairs were taking, obtained by bribes and promises a firmán in his own name for the government of Sindh; and leaving his son at court marched against *Attar Khan*. The wary and politic *Ghulam Shah* no sooner learnt the supercession of *Attar Khan*, than he proceeded to dislodge him. Thus threatened on both sides, *Attar Khan* fled to the *Daud Putra* tribe, whilst the force of *Ghulam Shah*, by a decisive and bold advance to the capital, deterred *Ahmad Yar Khan* from further progress.

The country once more under the control of a chief, who was a fa-

vorite of the natives, found time to recover from the effects of the late intestine disturbances, and civil war in its most hideous form, which had ravaged Sindh for two years. During this period, three competitors struggled for supremacy; and to aid their views, had recourse to the ruinous alternative of introducing lawless and powerful allies. From the Afghan troops, the natives of Sindh suffered every evil which an avaricious and disorderly army could inflict, and it is said that so far from acting like allies, they treated the province with more severity than would an enemy.

The *Kosha* tribes, who inhabited the division of *Sewistan*, had been very troublesome during the late contest; and from the position which they occupied, in the pass from Kandahar, had been of essential service to *Attar Khan*. *Ghulam Shah*, as the first act of his government, inflicted on them an exemplary punishment. Their villages were reduced to ashes, their strong holds carried by assault, and their garrisons, with the families of the tribe, put to the sword.

Bahadúr Khan the chief of the *Daúd Putras*, had hospitably received *Attar Khan Kalhora*, and as the former prided himself on his prowess in arms, and was highly esteemed by the tribe, for his military talents, it was not a difficult task to induce him to espouse the cause of his fugitive guest. The preparations of the *Daúd Putras* were however not as yet matured, when their territory was invaded by *Ghulam Shah*, who attacked and slew *Bahadúr Khan*, in a desperate battle; in which the troops of the latter being totally routed, *Attar Khan* fled the country, and this single action terminated the war.

A. H. 1773. A. D. 1759.

In the year 1174 H. the Jam of *Kakralla* was dispossessed of his lands and authority, in consequence, as it is reported, of his conduct during the absence of *Ghulam Shah* in the north; and was accused of having attempted forcibly to re-occupy those parganahs which had been ceded to the *Kalhoras* on a former occasion. But there does not appear any sufficient grounds for such treatment of a family which had adhered to the interests of this *Kalhora*, when he was surrounded by enemies. The Jam fled to Kach, and his son *Hirduriee* having been included among the officers of *Ghulam Shah*, the *Kakṛalla* lands henceforth became dependent on the *Kalhora* family.

A. H. 1174. A. D. 1760.

Miyan Ghúlam Shah, although actually in possession of the govern-

A. H. 1175. A. D. 1761. ment of Sindh, was sensible of the flaw by which his authority was exposed to constant question and danger. He had been long intriguing at Kandahar to procure a firmán which would legitimize what he was conscious was as yet only an usurpation; and the negociation of his ambassadors were this year crowned with success. The firman, so anxiously expected, was transmitted to him with the honorary title of *Shahwardi Khan*, and accompanied by a present of an elephant.

This year was distinguished by a successful attack on the *Daúd Putras;* after which *Miyan Ghulam Shah* invaded the independent province of Kach. This expedition originated in the wanton spirit of plunder and rapine so common to Asiatic governments. *Rao Laka* (or *Lackpat*), who was at this time the chief *Jhareja* of the Kach aristocracy, had succeeded in releasing his person and authority from a disgraceful thraldom, in which they had been held by a rich and powerful civil officer named Púnja. On this dissolution of his power the latter fled to the court of *Ghulam Shah* and was instigated by him to attack his sovereign.

A. H. 1177. A. D. 1762.

The army of Sindh, which consisted of about 15,000 men, having conquered the frontier fort of Sindhri, crossed the salt Run without difficulty, and entered the Kach territory. *Rao Lackpat* had directed his federal chieftains to assemble at the pass of *Jharra,** in the mountains of which the women and children of the country were secured.

A battle was fought at this spot and is spoken of with wonder at this present day. The Sindhians surprised and attacked the *Jharejas* early in the morning; and a thick fog obscuring the light of day until noon† both armies were intermixed with each other fighting, sword in hand, for a period of six hours. The Kach soldiers, according to an ancient custom of the *Rajputs* determined on death, murdered the whole of their families; and rushing among their enemies commenced a promiscuous slaughter of friend and foe. When the fog dispersed, the contending parties withdrew from the field, but such was their consternation, at the events of the morning, that each made a precipitate retreat.

The Battle of *Jharra* is said to have cost the Kach nation 2000

* Twenty miles N. E. of Lackpat.

† In February and March the fogs are often so thick as to involve the day in total darkness.

lives, including the families slain. Scarcely a soldier of the army returned unwounded, and it is a common saying, expressive of the immense slaughter, that stones a pound in weight were moved from the side of the hill by the streams of blood. In 1812 there were three men alive in Kach who had fought at *Jharra*, and I have conversed with an aged man who received seven sabre wounds in this action. His description of the confusion, in which the armies were placed by the fog, was truly terrible. The Sindhians lost 7,000 killed and wounded.

The following year *Miyan Ghulam Shah* again invaded Kach, and penetrated, without opposition, to within a few miles of the capital; when he compelled the Rao to resign his claim to the seaports of *Basta* and *Lackpat*, which are situated on a branch of the Indus and on the borders of Sindh.

Miyan Múrad Yab Khan the elder *Kalhorá*, who had been dethroned by *Ghulam Shah*, had died shortly after the first expulsion of *Attar Khan*. He had left several sons who were, about this time, cruelly put to death by their uncle; in consequence, it is said, of the traits which they evinced of an aspiring disposition. The fact is not recorded in the history of the times, but it is well known and generally believed in the country. *Ghulam Shah* was however a favourite of fortune and his undertakings were generally successful. He had already received the
A. H. 1179. A. D. 1765. title of *Shahwardi Khan*, to which that of *Samsam-ad-dowlat* was now added. His mind was also at this time eased by a reconciliation with *Attar Khan*, who, failing in all his attempts on the government, threw himself on his brother's mercy, by whom he
A. H. 1181. A. D. 1767. was kindly received and provided with a suitable *Jagir*, under condition of remaining at all times in person at court.

The government of the *Deras*, or villages, which had been conferred
A. H. 1183. A. D. 1769. by *Nadir Shah* on the Afghans, was transferred to *Ghulam Shah*, and in 1183 re-transferred to a *Kandahar* officer. The *Kalhora*, who had been employed in the north, arranging his recent acquisitions, now returned and took up his abode in Hyderabad, the foundations of which he had laid the preceding year.

The Rao of Kach courted the friendship of *Ghulam Shah*, by offering the daughter of one of his *Bahiyad* in marriage. The *Jharejas* of Kach practice female infanticide, but daughters are occasionally preserv-

ed. The *Rajputs* have a custom of giving their daughters in marriage to *Hindus* or *Mahomedans*, if by the connexion, their inheritance can be preserved from danger. This is the only cause for which it is lawful to form such an alliance. It is common to adopt daughters of any caste for the purpose of being so disposed of, but this is done privately and the imposition though known is not notorious. The lady given to *Ghulam Shah* is said to have been of this description. The alliance was accepted, which as the proposal had been voluntary gave rise to many reciprocal attentions. *Lackpat* and *Basta Bander* which had before been conquered, were on this occasion restored to Kach. *Ghulam Shah* survived this connexion but a short time; he died at Hyderabad in the beginning of 1186 H. after two days illness, attributed, by *Mahomedan* superstition, to the wrath of the saints, whose graves had been disturbed, in founding the new capital.

A. H. 1186.
A. D. 1772.

Sahib Zadah Sarafraz Khan, was placed in possession of his father's dignity by the universal voice of the country, and the selection was approved by the Kandahar government. The first year was employed in settling the affairs of the province and arranging the northern districts, which were at this time again transferred to the *Kalhora* authority. These measures having been concluded, the Sindhian army was led to Kach, through which it passed into Wagar on the borders of Gujarat. Having received the submission of the *Chief Jharejas*, *Sarafraz Khan* marched from Wagar through the *Chowan* territory, and thence crossing the desert by the route of Parkar returned to Sindh in the 1188 Hej.

Miyan Sarafraz Khan.

The *Baluchi* tribe of *Talpura* had long filled the most distinguished offices of the government, and they had, at different periods of the *Kalhora* fortunes, essentially aided in supporting them by their arms and counsel; and had acquired a degree of influence and power, which, under a chieftain of less vigor and talent than *Ghulam Shah*, would have been considered as extremely dangerous to the public peace. *Mir Byram Khan*, the leading person of the *Talpuras*, had possessed the confidence of *Ghulam Shah*, a circumstance which procured him many enemies, among such as fancied themselves better deserving of favour from an immediate connexion with, or from ancient attachment to the reigning family. On the accession of *Sarafraz Khan*, these were not wanting in their endeavours to excite in his mind a jealousy of the views of *Mir Byram*,

which feeling was, perhaps, sharpened by the respect in which the *Mir* was held by the province in general, and which combined with the devoted attachment of his tribe, placed him on a footing little beneath that of his sovereign.

Sarafraz Khan, on his return from the Kach expedition, caused the suspected nobleman and his son *Mir Sobhdar Khan* to be privately put to death. Whether this severity arose from the discovery of treasonable proceedings, on the part of the sufferers, or whether it was the result of an unfounded jealousy, is not well ascertained; but it is certain that the *Talpuras* had assumed a very high and alarming control in public affairs. This act of the government, although unattended at the moment by any extraordinary commotion in the country, nevertheless created a deep impression on the minds of the military tribes, (of which the Talpura was among the most powerful) and led the way to those revolutions, which, at no very distant period, placed the family of *Mir Byram* on the throne of Sindh, and sank that of *Kalhora* in poverty and distress.

So early as 1758 A. D. the East India Company had established factories at *Thatta* and *Shah Bander*, where their mercantile speculations were encouraged by *Miyan Ghulam Shah*, with whom a friendly intimacy subsisted, productive of reciprocal advantage. The state of the society and government of Sindh, however, have constantly been unfavourable to the success of trade. The changes in the government have been so frequent that the merchant has never felt himself secure; a circumstance which, operating in conjunction with the hazard of transporting goods through various barbarous tribes, unrestricted by civilized control, has always obstructed this natural channel. *Sarafraz Khan* did not extend the same encouragement to the British factories as had been done by his father, and continued from time to time to obstruct their views and injure their interests, until it became necessary to withdraw them entirely.

Three years subsequent to this period, *Sarafraz Khan* was deposed by the *Baluchis*, who placed his brother *Miyan Mahomed Khan* on the masnad. His incapacity rendered a further change necessary; and *Sadik Ali Khan*, a nephew of *Miyan Ghúlam Shah*, was selected. The object of their choice upon trial did not suit their views, and the *Ba-*

Luchi chiefs once more indulged their caprice by elevating *Miyan Ghulam Nabiy Khan* a brother of the late *Ghúlam Shah.*

The period was, however, now arrived when the blood of *Mir Byram Talpura* was to be revenged on the *Kalhora* family. The deceased had a son named *Mir Bejar*, who at the time of his father's death was absent on a pilgrimage to *Mekka*; and *Ghulam Nabiy* had been a short time seated in his authority when this officer landed in his native country, and assembling his tribe publicly announced his design of opposing the government. *Ghúlam Nabiy* hoping, by a sudden and decisive battle, to check the spirit of defection which spread rapidly through the military tribes, attacked the Talpuras but was slain in the action.

A. H. 1187. A. D. 1773.

In the meanwhile *Miyan Abdúl Nabiy*, a brother of the deceased, shut himself up in the fort of Hyderabad, where he cruelly put to death *Attar Khan*, *Sarafraz Khan*, and *Mir Mahomed Khan Kalhoras*, who had at different times, held the sovereign authority. His object in thus embruing his hands in the blood of his nearest relatives, it is difficult to discover. It could hardly have been jealousy, because the victims were already prisoners; and as such could not be dangerous to his projects. Indeed this atrocious conduct would appear to have been the effect of a naturally cruel and blood-thirsty disposition.

Mir Bejar laid siege to Hyderabad, but, finding his means inadequate to its reduction, he opened a negociation which terminated in *Abdul Nabiy* being elected sovereign of Sindh, whilst *Mir Bejar* was confirmed in the offices of Minister, which had been so long held by his family. This arrangement placed the active administration of affairs in the hands of the *Mir*, (with which his ambition was probably satisfied,) without incurring the odium and danger attending a total exclusion of the *Kalhora* dynasty, which was still an object of veneration among the people.

During the government of *Abdul Nabiy* the province was invaded by an army from Kandahar, sent to enforce a sannad which had been issued by the king, placing *Izat Yar Khan*, a nephew of *Abdúl Nabiy* on the throne. *Mir Bejar* defeated the Afghans in a battle near *Shikarpúr*, and the pretender having fled, the victor returned to the capital, where he continued successfully to guide the reins of authority.

A. H. 1195. A. D. 1781.

The infatuated *Kalhora*, himself uneasy under the tutelage in which

he was held, notwithstanding the examples which had so recently passed before him resolved to cut off his Minister by assassination. Various attempts are said to have been made and failed; but he was at length successful, through the friendship of the *Raja* of *Jhodpur*. Two *Rajputs* visited Hyderabad, and under a pretence of business were admitted by *Mír Bejar* to a private conference, when they stabbed him to the heart. The assassins were shot from the roof of the room, perforated for the purpose, none having courage to face them sword in hand. It is by no means uncommon for *Rajputs* to devote themselves to death with a view of serving their master, and, among the Rathores of Marwar, in particular, there is little difficulty in finding agents of this description; but it must be remarked that it proceeds entirely from devotion to their chieftain, and the person who would assassinate at his simple command, would spurn any attempt to bribe him to the office. In 1814, there was an instance of two *Rathore Jemedars* thus sacrificing themselves at the request of the Rao of Kach.

Abdúl Nabiy attained his object, but, with a timidity characteristic of the abettor of such a deed, fled with precipitation to the court of Kelat, leaving his authority to be usurped by *Abdullah Khan* the son of the deceased; who, with his natural cousin *Mír Fattah Khan*, assumed the sovereign control of the province.

In the year of the Hej. 1196 the cause of the exiled *Abdúl Nabiy* was espoused by *Nasir Khan Barrohí*, who appropriated a select body of his troops under a relation named *Mír Zorak*, to reinstate the *Kalhora*. The attempt having failed, the *Talpúras* flocked to the standard of *Abdullah*, and defeated the *Barrohis* in a bloody contest in which *Zorak* lost his life. *Abdúl Nabiy* despairing of further aid from Kelat, once more crossed the mountains of *Baluchistan* and fled to the court of *Jhodpúr*, where he met with a warm reception. The *Raja* retained the prince at court, whilst he detached an army to pave the way to the overthrow of the *Talpurás*. The *Rajputs* were however defeated by the former, in a battle said to have been seldom equalled in the fury with which it was maintained; and the wretched *Kalhora* thus disappointed on all sides, repaired to the camp of the King of *Kandahar*.

A. H. 1196. A. D 1782.

Here he persuaded some of the courtiers to lay his prayer before His Majesty, who at length nominated *Maddad Khan*, a general of distinc-

tion, to command a formidable force on this service.* On approaching the Sindhian frontier, the *Afghans* were reinforced by a detachment of *Barrohis* from Kelat, and *Abdullah Khan*, having laid the country waste, sent the women and children into Kach, and took refuge in person in the great desert. The Afghans finding neither friend to greet nor foe to oppose them in Sindh, called upon the *Talpuras* to acknowledge *Abdúl Nabiy* and resume their respective ranks and situations at his court; a proposal which was readily acquiesced in by *Abdullah*; and the original system of government was once more established.

The calm was momentary, for *Abdúl Nabiy* again raised the flame of civil discord by unjustly and cruelly putting to death *Abdullah Khan Talpura*, a few days after the latter had renewed his allegiance. *Mir Fattah Ali* the son of *Mir Sobhdar*, and grandson of *Byram Khan* was unanimously elected chief of the *Talpùras*, and by a series of gallant exertions drove the *Kalhora* from the throne which he himself occupied. Over anxious however to remove those who bad a more legal claim to the masnad, his conduct alarmed his nephews, *Mir Sobhdar* and *Mir Jharra* the sons of *Fattah Khan*. These princes privately fled from Hyderabad, the former to *Lohri* and the latter to *Badban*, where they both finally established chieftainships, and where they still remain powerful federals of the Sindhian government.

One more effort was made by the deposed *Kalhora* to recover his lost kingdom.† Aided by a powerful army from Kandahar and Kelat, he entered the province where he was joined by a considerable body of partizans. According to custom, the *Talpuras* having secured their families in Kach, laid waste the frontier and avoided an action until having succeeded in purchasing the neutrality of the auxiliaries, *Mir Fattah Ali* attacked the troops of *Abdúl Nabiy*, who being defeated with immense slaughter, fled to *Sewistan*.

About the same period *Zeman Shah* ascended the throne of *Kandahar*, and led an army towards Sindh to enforce payment of the tribute which had been irregularly discharged since the separation of *Jharra* and *Sohrab*. The advance of the King was checked by a deputation from the three *Talpúra* chiefs, (who had caused Sindh to be deserted

* This expedition is mentioned in Elphinstone's Cabul II. p. 359.

† This expedition is the one probably mentioned by Elphinstone; Cabul II p. 369.

and taken refuge in the desert,) apologizing in the most humble terms for their past neglect, and promising more regularity in future. *Fattah Ali* had a warm friend in the Wazir, who persuaded his master to desist from the expedition, and afterwards procured a firman for the government of the province in the name of the *Talpúras*, an event which finally put an end to the dynasty of the *Kalhora* sovereigns. The wretched *Abdúl Nabiy* wandered from place to place until he fixed his residence finally at *Jhodpur*, in Marwar, where his family still hold a distinguished rank.

It is only necessary to add, that, when no longer threatened from foreign war, the *Talpuras* became jealous of each other. A strong party supporting the cause of *Mir Ghulam Hussain* the son of *Abdullah Khan*, who was ultimately placed in the government under the protection of *Mir Fattah Ali*, who in concert with his brothers *Mir Ghulam Ali*, *Karrim Ali*, and *Murad Ali* continued to manage the affairs, whilst the independence of *Jharra* and *Sohrab*, in their respective territories was regularly guaranteed.

The preceding pages record one continued struggle for greatness during a period of three centuries, and the object so ardently desired had scarcely been attained, when the same powerful hand which raised the mendicant *Kalhoras* to the throne, in the short space of ten years hurled them headlong to their original obscurity; destined to stand a memorable proof of the changeable nature of worldly affairs, and the futility of human exertion.

It is remarkable that the nation of Sikhs originated much in the same manner and struggled at the same period of time as the *Kalhoras*, but in the issue with bettter success.

ART. IV. — *Observations on the Sindh Musquitoe.* By J. H. CARTER, Esq., of the Bombay Medical Service.

I send the Society a drawing of a species of musquitoe, which is very common in Lower Sindh and is generally termed by the Europeans a sand-fly. Its bite is equally poisonous with that of the common musquitoe, though the swelling that follows it is not so extensive.

It differs from the common musquitoe in not being more than one

third of its size, and is almost colourless bordering upon white. The body and wings are covered with tufts of hair. The proboscis larger at its extremity than at its base, but not suddenly dilated, as in the common musquitoe, and the external or horny sheath is formed of four separate portions of equal size and length, concave externally and pointed in an obtuse angle at their extremities, and within them is inclosed a single stylette. The palpi like those of the common musquitoe are longer than the proboscis, and bent downwards at their extremities.

OF THE PROBOSCIS, ALIMENTARY, AND GENERATIVE ORGANS OF THE MUSQUITOE, CULEX PIPICUS.—*Linn.*

Distinguishing marks of the two sexes.

Before entering on the description of the internal organs of the musquitoe, it may be as well to notice the principal external points of difference that exist between the male and female of the species. These are the following:—

Body of the male much more slender than that of the female. Antennæ, though of the same length, much longer and more plumose than those of the female, and contain double the number of joints. Palpi in the male very largely developed, compared with those of the female, first joint extending nearly to the extremity of the proboscis. Two hook-like processes or claws inclined downwards from the upper part of the last segment in the male, which do not exist in the female, where they are replaced by two processes one on each side of the anus.

Of the Proboscis.

This is a most complicated organ, compounded of all the parts of the mouth except one pair of palpi. The following is the order in which the different parts are placed in relation to each other. Externally is the proboscidian sheath; within this, a transparent horny sheath, and again within the latter three setæ, one of which is spear-pointed, and the other two saw-pointed at their free extremities.

The proboscidian sheath, which incloses all the other parts, is a membraneous, cylindrical tube, arising from the inferior part of the head; it is about half the length of the whole animal, is covered externally with hairs and scales, and is open superiorly, by a longitudinal fissure, which

extends throughout its whole length. Towards its free extremity it becomes contracted, and terminates in a bilobate portion, consisting of two hollow pouches, round externally and covered with hairs, and smooth internally where they are in contact with each other.

The internal sheath is not quite so long as the last. It is formed of a stiff, horny, transparent, cylindrical tube; is in continuation posteriorly with the pharynx, and is firmly fixed above to a rostrated process which projects forward from the anterior part of the head, just below the tubercles of the antennæ. From this point also it is reinforced by two distinct portions, one on each side, which soon become incorporated with it. Its free extremity bears a great resemblance to the point of a pen, and is extremely sharp and delicate. Posteriorly it is continued back through the head to the pharynx, where it dilates into a horny hollow bulb, and then becomes contracted again to its original calibre before joining it. On its inferior aspect, it is also open longitudinally, by a fissure, which extends from the pharynx to its free extremity. Within it are inclosed three setæ.

One of these is spear-pointed and is fixed posteriorly on the median line between the proboscis and internal sheath, which it immediately enters and is continued to its extremity.

Below it lie the two saw-pointed setæ in close approximation. They are fixed posteriorly, one on each side the spear-pointed setæ, close to the inner edge of the palpi, and soon approaching each other enter the horny sheath, and in like manner are continued to its extremity, when their serrated edges are turned towards each other.

The pair of palpi are placed immediately above the base of the proboscidian sheath, at the base, and on the outer side of the saw-pointed setæ.

The following appear to be the analogies of the different elements of the proboscis:—

The proboscidian sheath is a prolongation of the under lip or labium.* The central spear-pointed setæ may be compared to the mandibles united, and the two saw-pointed setæ and the pair of palpi annexed to them to Masellæ, and their palpi. The palpi of the labium may be considered to be incorporated with the proboscidian sheath.

During the act of puncturing the skin in search of food, the pro-

* The internal sheath is an elongation of the upper lip or labium.

boscidian sheath is retracted, and drawn towards the breast, so as to uncover the penetrating instruments. This takes place simultaneously with their insertion, and the juices are probably conveyed into the pharynx, and principally through the internal horny sheath.

In the male, the proboscis is very imperfectly developed, and from never having found any food in the stomach, it is probable that they bite less frequently, and are therefore far less troublesome than the female.

Alimentary Organs.

The pharynx, which is continued backwards from the horny sheath to the œsophagus, is short and narrow, and just before it joins the œsophagus, receives the ducts of three glandular bodies.

The œsophagus is large at its commencement, becomes gradually narrower towards the stomach, where it ends in a short, dilated portion, which after being slightly contracted, swells out again into a pear-shaped stomach with its large end posteriorly. The pylorus is contracted and narrow. The ileum short and straight, and ends in the colon, which is dilated at its cœcal extremity, and in its substance contains several cordiform glandular bodies attached to each other by small vessels having a cellular appearance internally. The colon is then continued straight to the rectum where it becomes contracted again to form the anus.

Generative Organs.

In the Female. The ovaries consist of two delicate transparent sacs one on each side the rectum and contain round transparent ovales. The oviducts are short, and both terminate together close to the anus.

In the Male. The generative organs consist of three pairs of glandular bodies; one pair of which are long and ovoid, and are placed close to the posterior end of the stomach; from each of them a delicate duct is continued back to two other glands, which contain a granular matter, placed side by side on the median line close to the anus. On each side of the latter are two other glands, containing a greenish yellow granular matter, they unite and terminate in the rectum close to the anus, at the same point as the latter, to which they are attached.

Biliary Vessels.

The biliary vessels are six in number; they enter the duodenal end

of the ileum close to the pylorus, and are convoluted round the large end of the stomach.

Explanation of the plate.

Fig. 1 Musquitoe magnified 8 times. Female.
2 Male.
a Antennæ.
b Palpi.
c Hook-like processes of the tail.

Fig. 3 Diagram of the elements of the proboscis magnified 16 times.
a Neck.
b Head.
c Antennæ.
d Œsophagus.
e Internal sheath or labium.
f Proboscidian sheath or labium.
g Spear-pointed setæ.
h h Saw-pointed setæ.
c Palpi.
k Dilated portion of internal sheath.

Fig. 4 Magnified view of the extremity of the proboscis.
a a Bilobate portion.
b Longitudinal fissure.

Fig. 5 Magnified view of the extremity of the internal sheath.
a Pen-pointed extremity.
b Longitudinal fissure.

Fig. 6 Alimentary canal.
a Internal sheath.
b Dilated portion.
c Longitudinal fissure.
d Pharynx.
e e e Œsophagus.
f f f Salivary glands.
g Stomach.
h h h Biliary Cœca.

Fig. 6 i Ileum.
k Colon and rectum.
l Anus.
m m Processes at the oval extremity of the female.
n n Ovaries and their ducts.

Fig. 7 Glandular bodies found in the cœcal end of the colon.

Fig. 8 Male organs of generation.
a a Testicles.
b b Their ducts leading to vesiculæ seminales.
c c Vesiculæ seminales.
d d Two glandular vesicles containing a greenish yellow granular secretion.

Fig. 9 Magnified view of the free extremities of the elements of the proboscis exposed.
a Superior surface.
b Inferior surface.

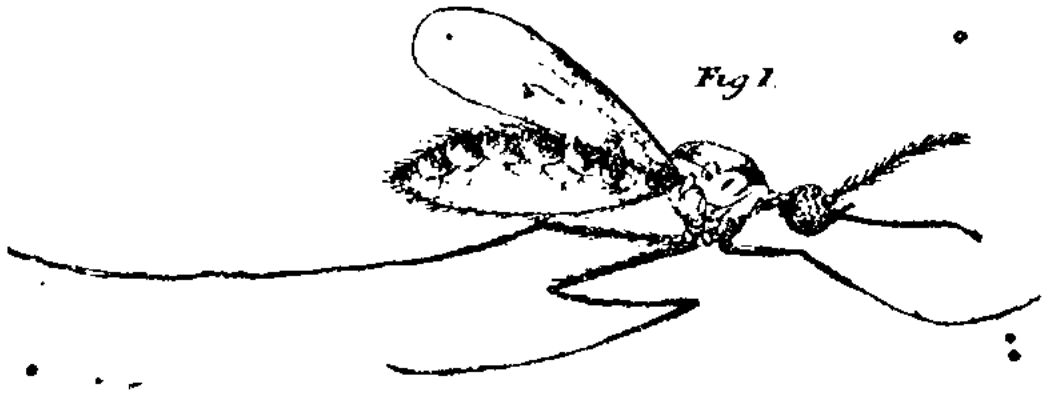


Fig 1.

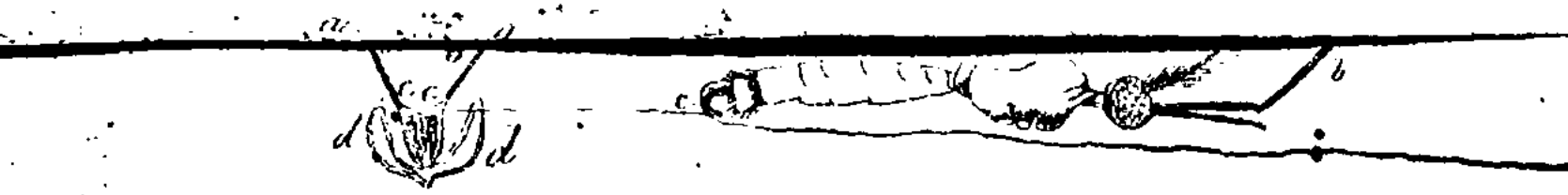


Fig 2

Fig 3

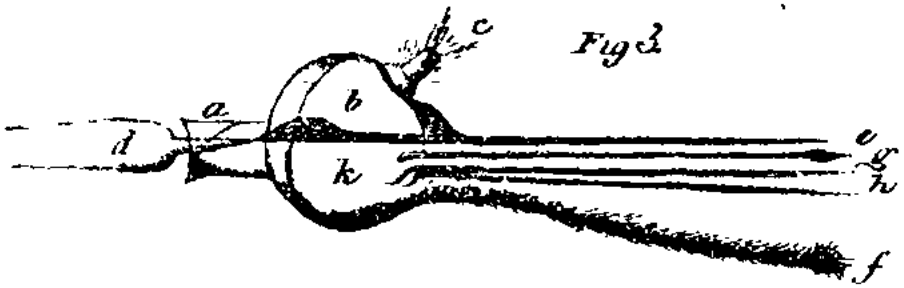


Fig 4.

Fig 6.

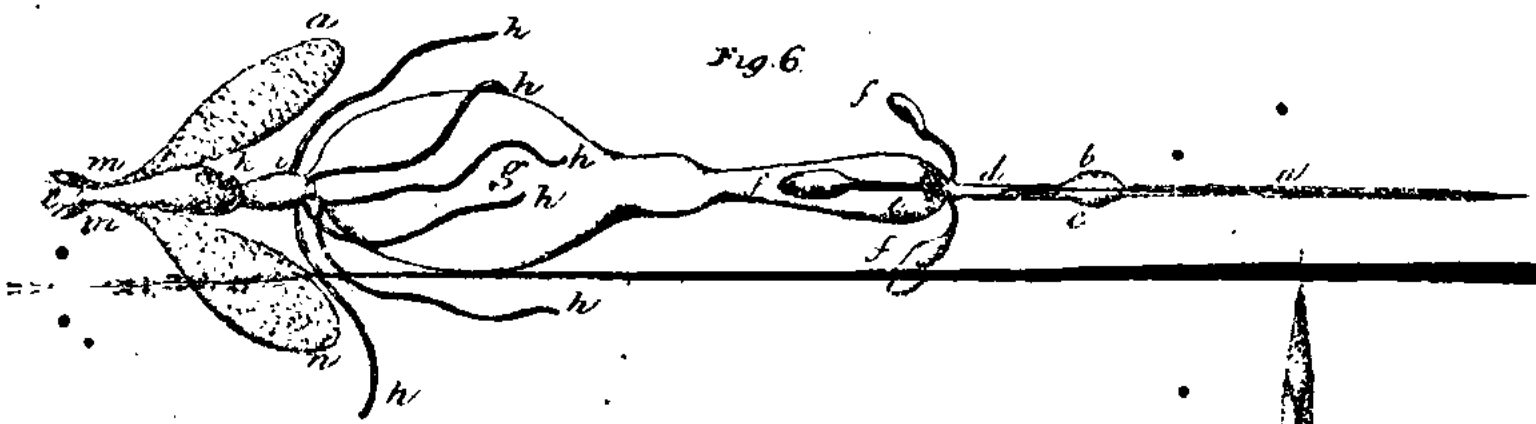


Fig 7

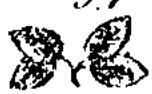


Fig 9

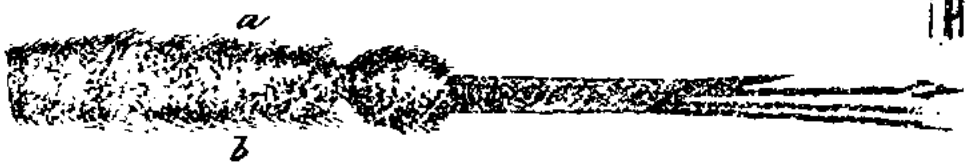


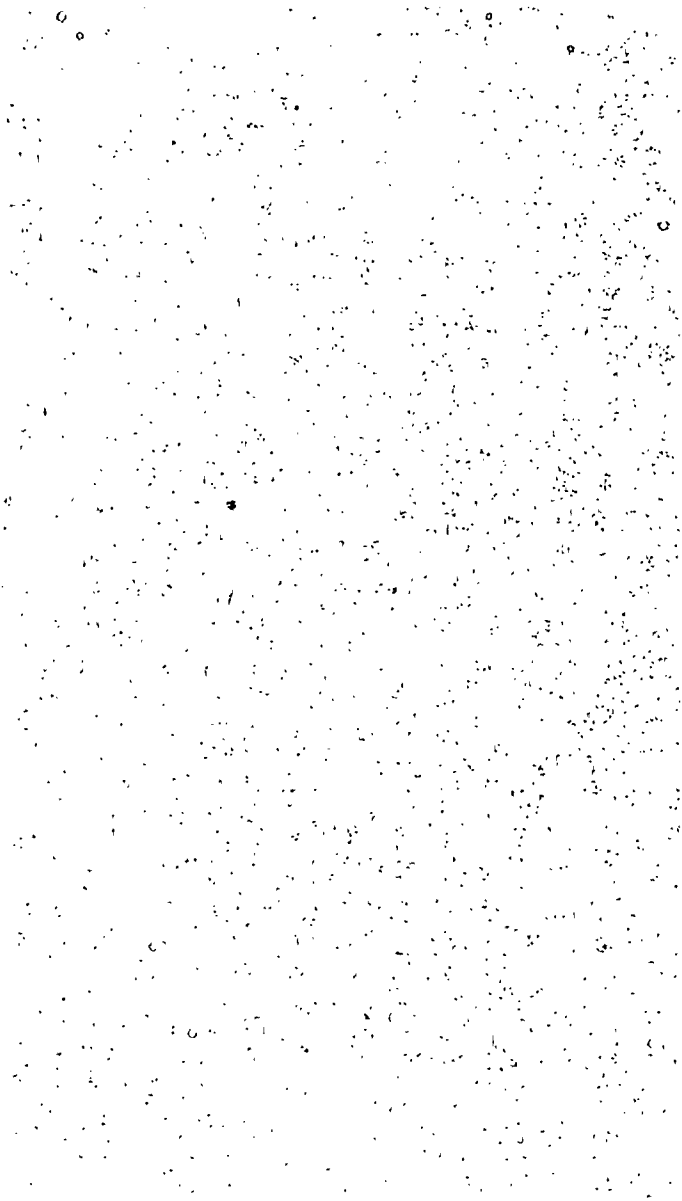
Fig 5.

Sindh Musquitoe Culex pipiens. Linn

Fig 1. female 8 times natural size

2. Magnified 16 times natural size

Hamphreville Lith:



ART. V.— *Note on a Specimen of Iron Ore from the vicinity of Malwan.* By BALL G. SHASTREE, Esq.

The accompanying is a specimen of the ore from which iron is extracted in the vicinity of Malwan. Though the laterite, in which this ore occurs, almost everywhere overlaps the basalt and other rocks, in the Southern Konkan the ore is generally found only in detached masses, on the tops of hills, not far from ground, its presence being indicated by the appearance of small ferruginous fragments on the surface. The following description of its minerological and chemical properties has been supplied to me by Bhaú Dajï, the assistant to the Chemical Professor in the Elphinstone Native Education Institution, who examined it at my request.

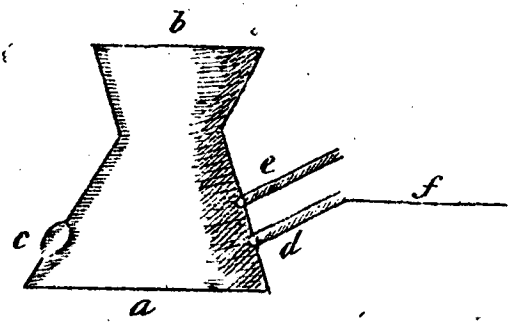
"It is massive, compact, externally brown or reddish brown, internally steel-grey, glimmering. Brittle, streak yellowish brown, fragments splintery, sharp, fracture flat conchoidal. Spec. gra. 3.32. Before the blowpipe, it yields a dark blue shining enamel, attracted by the magnet. Its constituents have been found to be water, the *black oxide* and *peroxide* of iron, *alumina, silica, a trace* of *manganese and magnesia.*

"A considerable portion of this mineral contains a shining steel grey lamellar powder, which is most difficult of solution both in nitric and muriatic acids. It is supposed to be the black oxide, which is regarded by many chemists as a distinct oxide—a mixture of the oxide and peroxide of iron in various proportions."

Though the process employed at Malwan, for extracting the metal from the ore, is nearly the same as that adopted elsewhere in India, and described in Mr. Prinsep's Gleanings of Science (vol. 1st p. 230 and vol. 3d p. 328, 330), the following details on the subject, literally translated from the letter of a friend residing on the spot, may be interesting for the sake of comparison.

"Equal measures of this ore and that of charcoal, reduced to fine powder, are intimately mixed by means of water, and smelted in a furnace which is represented in the following diagram.

"It is round and about three feet in height; its diameter at the bottom is nearly a foot and a half, and at the top, about a foot. *c* is a circular opening three inches from the bottom and about 9 inches in diameter, through which the half melted mass of iron is taken out. *d* and *e* are two apertures for the insertion of the pipe of the bellows. *f* the place where the bellowsman sits about two feet from the ground.



"The furnace is loaded with about 10 *paylies*, or about 80 lbs. of charcoal. A seer or about 2 lbs. in weight, of the mixed powder is now thrown in together with charcoal sufficient to reduce the ore. The opening *c* is closed up by a stone and clay, and the materials in the furnace ignited. The bellows consist of single skins of goats worked by the hands.

"When the powder is formed into a mass, (which may be seen from above), the furnace is again loaded with about 2 lbs. of the powder. The half melted mass is taken out, through the openings, by means of a Paori or shovel, and is beaten by heavy hammers on an anvil. The iron is then ready for sale. If a large quantity of iron is to be prepared, fresh quantities of powdered ore are successively added to the melted mass, and allowed to be incorporated with it, until a mass of about 20 lbs. in weight is obtained."

A process somewhat different from the preceding is more frequently employed. It is as follows:—

"The ore is exposed to sunshine for a week or two to deprive it of moisture. It is then carried to the place of manufacture and roasted, which renders it brittle and capable of being easily reduced to powder, in which no pieces larger than a pea are allowed to remain.

"The next operation is to put in about 2 paylies or 16 lbs. of fine charcoal powder, at the bottom of the oven described above. Upon this

are put cinders, and wood charcoal is thrown in up to the brim. The bellowsman begins his task, and when the ignited mass, in the inside of the furnace, subsides a little, about half a seer by measure, or 1 lb. in weight, of the powdered ore is thrown in with about two paylies or 16 lbs. of charcoal. When again the fire has subsided about 9 inches, the same quantity of ore and charcoal is thrown in. This is continued from 6 to 9 o'clock in the morning. No more powder is now employed, but the bellowsmen continue blowing for about 3 hours more. By this time a mass of iron is formed at the bottom of the oven, from which it is taken out through a hole made for this purpose, by means of a large pair of pincers, and placed on an anvil, on which it is beaten by heavy hammers.

"Thus a piece of good iron about 10 seers in weight is obtained. It is called by the natives Madagé. A similar quantity is made in the afternoon. One piece is sold for about 8 annas, one half of which is given to the bellowsman.

"The manufacture of iron is the exclusive trade of a class of natives called Dhâwar. The agricultural classes are also acquainted with the process; but if they want to prepare any iron, they have recourse to a Dhâwar. For if any person were to attempt to manufacture it at his house, he would be liable to be deprived of his caste.

"The smelting of iron is carried on at Masará, Kholala, Vayangaon, and several other villages. There are generally 4 smelting furnaces in each village. As the operations of these require an immense expenditure of fuel, the principal men of the villages do not allow the Dhâwars to settle in large numbers in their vicinity. No great quantity is therefore produced in any one of them. The charcoal used is from *soft* wood; that of Khair (the Mimosa Catechu) is hard, and is said to produce no iron if employed. As iron bars and blocks have found their way here, the quantity of the metal now manufactured in this district cannot be worth more than about a thousand Rupees annually; being one-half of what was produced under the former Government.

5th February, 1844.

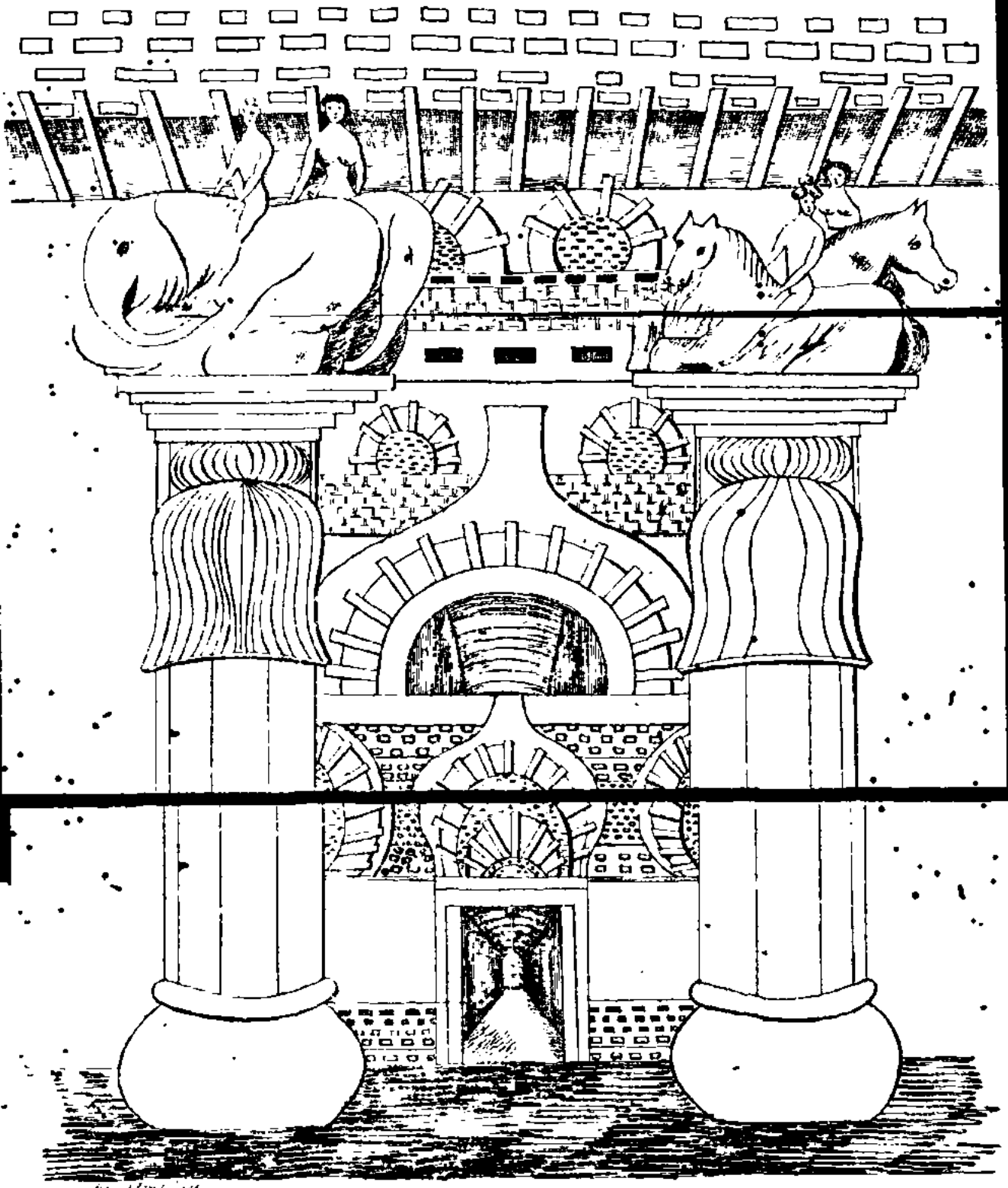
ART. VI.— *A brief account of the minor Bauddha Caves of Beira and Bajah, in the neighbourhood of Karli.* Communicated in a letter, from Mr. N. L. WESTERGAARD, to JAMES BIRD, Esq., with translations, by the latter, of inscriptions found at both.

Some account of a cave at the village at Bajah, between Karli and Lohgarh, was sometime ago communicated by a member of this Society, Manockjee Cursetjee, Esq., and was accompanied by fac-similes of the inscriptions: but hitherto the more perfect excavations, at Beira, have not been noticed, and their existence seems scarcely known to Europeans. A rough sketch of the Beira cave, drawn from memory, accompanies this brief account of it, which I am enabled to give on the authority of Mr. Westergaard; but while, in the absence of more extended information, this may satisfy the curiosity of some in such matters, a fuller and more perfect account would still be of interest to the members of the Society.

Mr. Westergaard writes—I have just returned from a visit to the caves in the neighbourhood of Karli, and I am led to suppose that the minor caves, at Birsa and Bajah, might possibly have escaped your notice. I take the liberty to send you a short description, with copies of the few inscriptions there; hoping that you will not refuse this small contribution to your most important and interesting work on the Caves of Western India. The caves at Birsa, (or as it is called, in the map of the Poona Collectorate, Beira,) are situated about six miles S. W. from Wargam. The plan of the temple resembles Karli, but is neither of so great extent nor so well executed, and appears more modern. It contains a *Dehgop*;* and its roof, which is ribbed, and supported by

* This is a stone spire, of an hemispherical form, placed at the extreme end of the arched Bauddha caves; and is a type of the corporeal frame of the five elements, or the *Dhyani Buddhas*, being the same as the *Anushthana Sarira* of Kapila's philosophy, or vehicle of the subtle person or spirit.

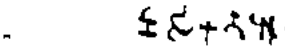
That, at the cave of Karli, is named, in the inscription on it, *Sansar-ratha*; or the worldly vehicle, and establishes a fact that it is meant as a type of a first cause, producing effects in the versatile world. It is in fact considered an aggregation of the elements, effected by the presidence of spirit; and viewed as a type of elemental creation, presents an analogy to the mundane egg, from which, according to the doctrines of antiquity, sprung the first born of the world.



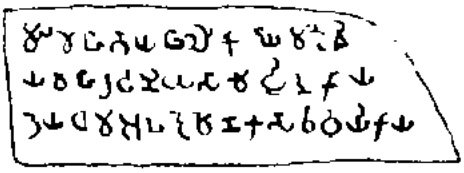
Part of the Principal entrance to Cave at Bura 12 Miles from Kurkud

Inscriptions from the Caves of Bara and Bajah near Wargam on the Poona road.

No I. Over a small Cell at Bara



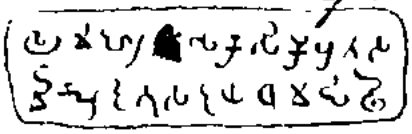
No II. Over a water reservoir



No III. On the first of the nine Dehyopas outside a Cave at Bajah.

Gramtopies by Mr. L.H. Westergaard

No IV. Over two Wells at Bajah

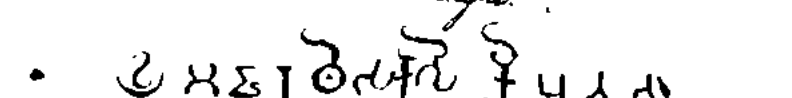


Duplicate Copies by Mr. D'Ochoa:

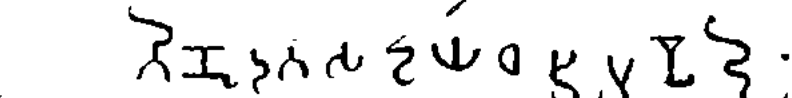
TEMPLE DE BODJA près KARLY.

Inscription placée dans un encadrement au dessus d'une citerne à gauche du temple de Bodjas

1re Ligne.



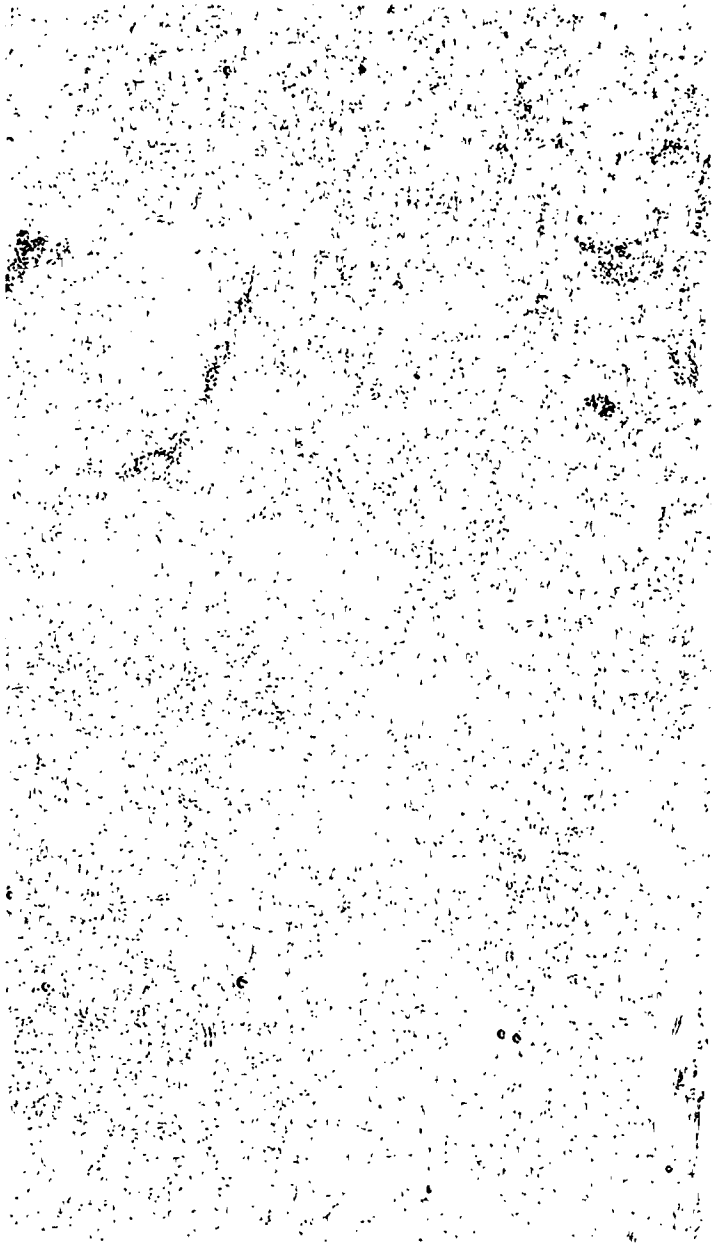
2e Ligne.



Inscription placée sur une porte latérale faisant partie du logement de Prêtres dans le temple de Bodjas.

Imp. Lemercier & Cie

Paris le
Janvier 1844 Ch. d'Ochoa



twenty-six octagonal pillars, about ten feet high, seems to have been covered with paintings, which are now, however, so indistinct, that nothing can be made out of them. There are four pillars, about twenty-five feet high, in front, surmounted by a group of horses, bulls, and elephants. The first pillar supports a horse and a bull, with a male and female rider; the next three elephants and one horse, two of the elephants having a male and female rider; the third three horses and one elephant, a male and female rider being placed on two of the horses; and the fourth pillar is surmounted by two horses bearing a male and female rider. The hall of instruction, which is of an oval shape, has a vaulted roof, and is situated close to the temple. It contains eleven small cells; and over the door of one of them there is an indistinct and partly defaced inscription, which will be immediately noticed.

The caves of Bajah are situated three miles S. E. from the village of Karli. The principal temple contains a *Dehgop* but no sculptures, and has its roof supported by twenty-seven plain pillars. Outside there is a group, executed in *bas relief*, now much defaced. On both sides of the chapel the hill has been excavated into two stories, corresponding with the height of the temple, and containing the usual halls of instruction, with cells. But the most curious of the sculptures is a collection of fourteen *Dehgops*, five of which are inside and the others outside the cave. On the first of the latter there is an inscription.

Mr. Westergaard, in his interesting correspondence with me, entered into an elaborate examination of the probably correct reading of the inscriptions at both caves; and while I felt myself under the necessity of dissenting, in part, from his observations, I was infinitely obliged to him, as they enabled me to give a more accurate reading and translation in my second letter. Mr. Westergaard's objections to the reading, first sent, applied chiefly to the vowel points employed, to the substitution of aspirated for unaspirated consonants, and to the use of cerebral for dental letters. To these I replied, that the *Prakrit* of the cave inscriptions, which contains a large admixture of *Pali* and *Sanskrit* words, is employed by the *Jainas* for the composition of their scriptures, and admits of the changes objected to, while its grammatical structure approaches nearer the *Magadhi* or *Pali* than the *Sanskrit*, and may be more correctly interpreted after the model of the former, than through a Sanskritized medium. I have since obtained a copy of the Bajah in-

scription by Monsieur D'Ochoa, which enables me to correct some points doubtful in Mr. Westergaard's copies.

The cave inscriptions, generally, embody religious and historical information, and strongly confirm, what the general principles of the *Bauddha* religion in various countries teach us, that this widely diffused system had its origin in *physical* and *metaphysical opinions*, on the subject of a *first cause*, made applicable to explain the phenomena of the world and of human nature; and was intimately connected, at its rise, with the worship of the heavenly bodies, and the *Sabean idolatry*. Hence it is that the inscription on the obelisk at Karli is declaratory of its dedication to the sun; while many of those from the caves of *Junir* are more fully declaratory of the different deifications, celestial and human, which were objects of worship among the Bauddhas; hence also the explanation of a fact, that the coins of the *Afghanistan* and *Panjab topes*, which have been accurately named *Mithraic*, present the same mystical symbols as precede the cave inscriptions, and are indicatory of the respect paid to the planetary bodies, and to fire. The group of horses, bulls, and elephants, on the four pillars in front of the arched cave at Beira, (Birsa) resembles what we find on the Indo-Mithraic coins of the North; and is evidence, were no other proofs procurable, that such belongs to the worship of the sun: for as *Proclus de Sacrificiis* observes:— "Animalia sunt Solaria velut leones;" and of the latter there are numerous sculptures in the Bauddha caves of Western India, accompanied by figures of the deer, tiger, &c.

The first inscription, from the Beira cave, described as executed over the door of a small cell, reads,

नासिकातपासिनोसासथपूतासपुवानाकमाह·

Nasika tapasino sa sathaputasa puvanaka maha:

and may be translated,

"*By an ascetic of Nasika resembling the purified Saint (Buddha,) the primeval heavenly great one.*"

Here *Sattha*, the Pali name for Buddha, is spelt with the aspirated dental *tha*, and without the usual *ta*, which constitutes the correct modern spelling of *Sattha*; which is a Prakrit corruption of the Sanskrit word श्रेष्ठ *Shreshtha*, meaning prëeminent, or most excellent, and the same

with *Seth*, an appellation given, by the Jainas and Parsees of Gujarát, to great and good men of rank and consideration.

The second inscription, from the same caves, said to be over a well, reads,

महत्यपालकैय्यमनुवयमहारतनय्यसामद्धिनकैय्यदयाधमाउपादमनाकासवात्यकैय्य.

Mahatya palakaya manavaya maharatanaya samidhinakaya dayadhama upada manakasa vatya kaya.

And may be translated,

"*A righteous gift of a small offering to the moving power, (body) the intellectual principle, the cherishing material body, the offspring of Manu, the precious jewel, the supreme heavenly one here.*"

Mr. Westergaard proposed to read, *Mahatuya palikaya* which perhaps might be rendered, "for the preservation of a quantity of water," but I prefer the original reading, as the cherishing principle of creation, alluded to in the inscription is doubtless water; under which form, and which symbol, the female divinity *Adi Prajna*, or *Adi Dharma*, charasterised by the *lotus* or *yoni*, is represented among the *Bauddhas*. The esoteric meaning of the inscription has reference to *Prajna*, who, as the active power of nature, is manifested, in Nepal, as *Jal-sa-rup*, or a form of water; and is represented, at the caves of Ajanta and Ellora, as a female, seated on the lotus, over whose head are descending streams of water.

Regarding the caves at Bajah, Mr. Westergaard observes, that the first of the inscriptions there, is on the first of the nine *Dehgopas*, outside the cave, and which have been already described. It reads,

पालन्न वसीभूत्तसातानाः

palanna vasibhutasatana:

And may be translated,

"*The resting places of the preserver dwelling in the elements.*"

Allusive, as would appear, to the influence of the sun, and his course amid the signs of the nine planets, of which *Rahu* and *Ketu*, or the nodes, form two; and are always inserted in Bauddha astrological diagrams, or systems of sidereal astrology, called in Ceylon *Baliah*;

which is the worship of the planetary powers, similar in many respects to the Syrian idolatry of worshipping and propitiating the *Balim*, or host of heaven, which protected and influenced mankind in health and sickness.* This part of the Bauddha system is connected with a belief in the efficacy of amulets and charms for averting the evil influence of the stars : and it is usual for both *Bauddhas* and *Jainas* to address their prayers to the *Dasa-Dik-Pals*, or ten regents of the heavenly quarters. One of the Bauddha astrological diagrams, shewing the mode of prognosticating from the signs of the planets, may be seen at page 114 of Sangermano's description of the Burmese Empire : and a similar diagram exists in the temple of Kargone, on the road to Malwa. In illustration of the above inscription, and its connexion with the Bauddha religion, I may briefly notice, that the late Dr. Bramley brought from Nepal two coins, on the obverse of which there is a seated image, accompanied by the inscription, *Sama gana*, the Supreme Quirister, and on the reverse the representation of a lion, or symbol of the sun, called *Siho nana*, the wise lion.

The next inscription from the Bajah caves is said to be over a well, and reads,

महारथशाकशाकपूतसातानंदातसादय्यादमापादः

Maharatha sakasakaputasa tanamdatusa dayadhamapada.

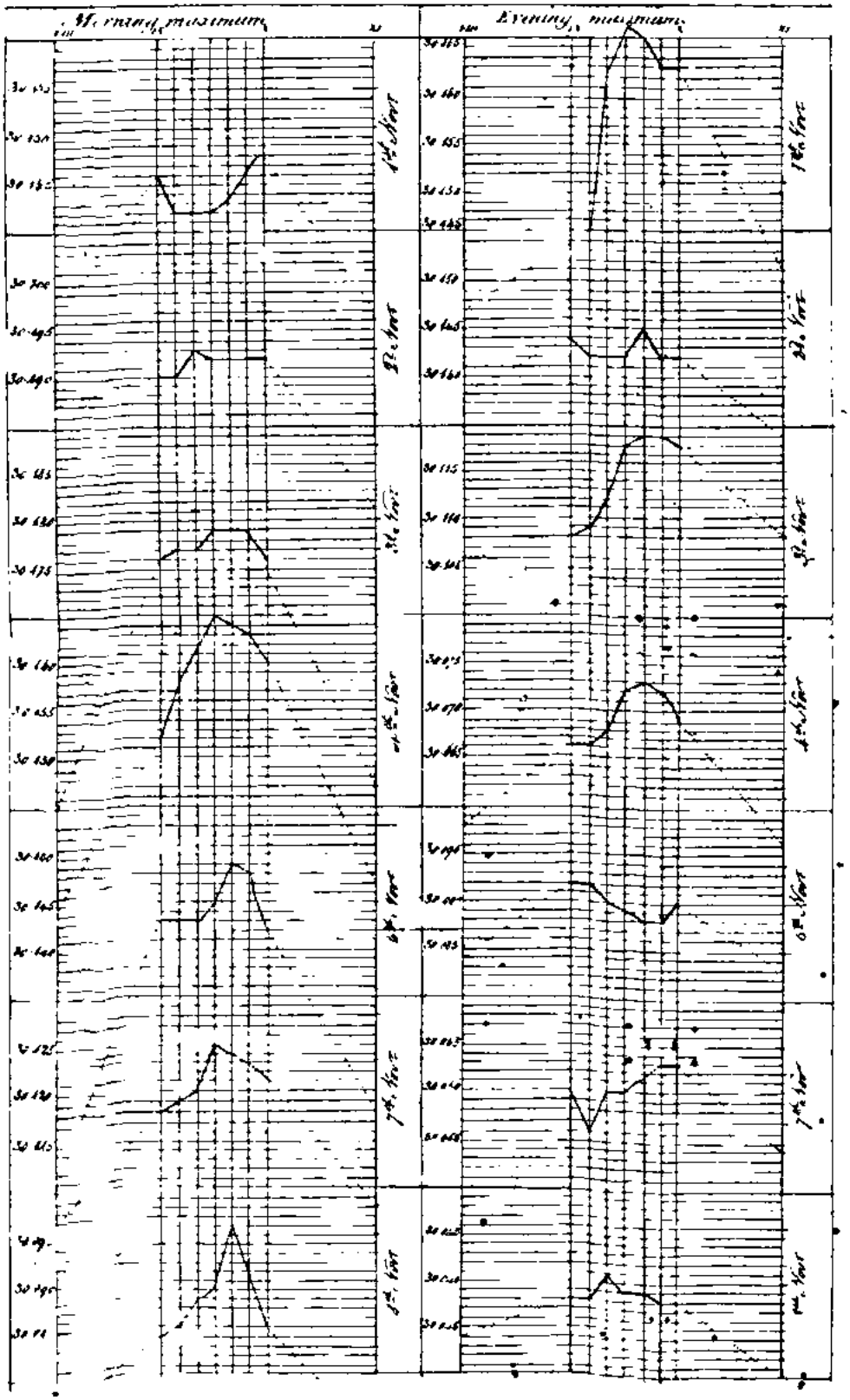
And may be translated,

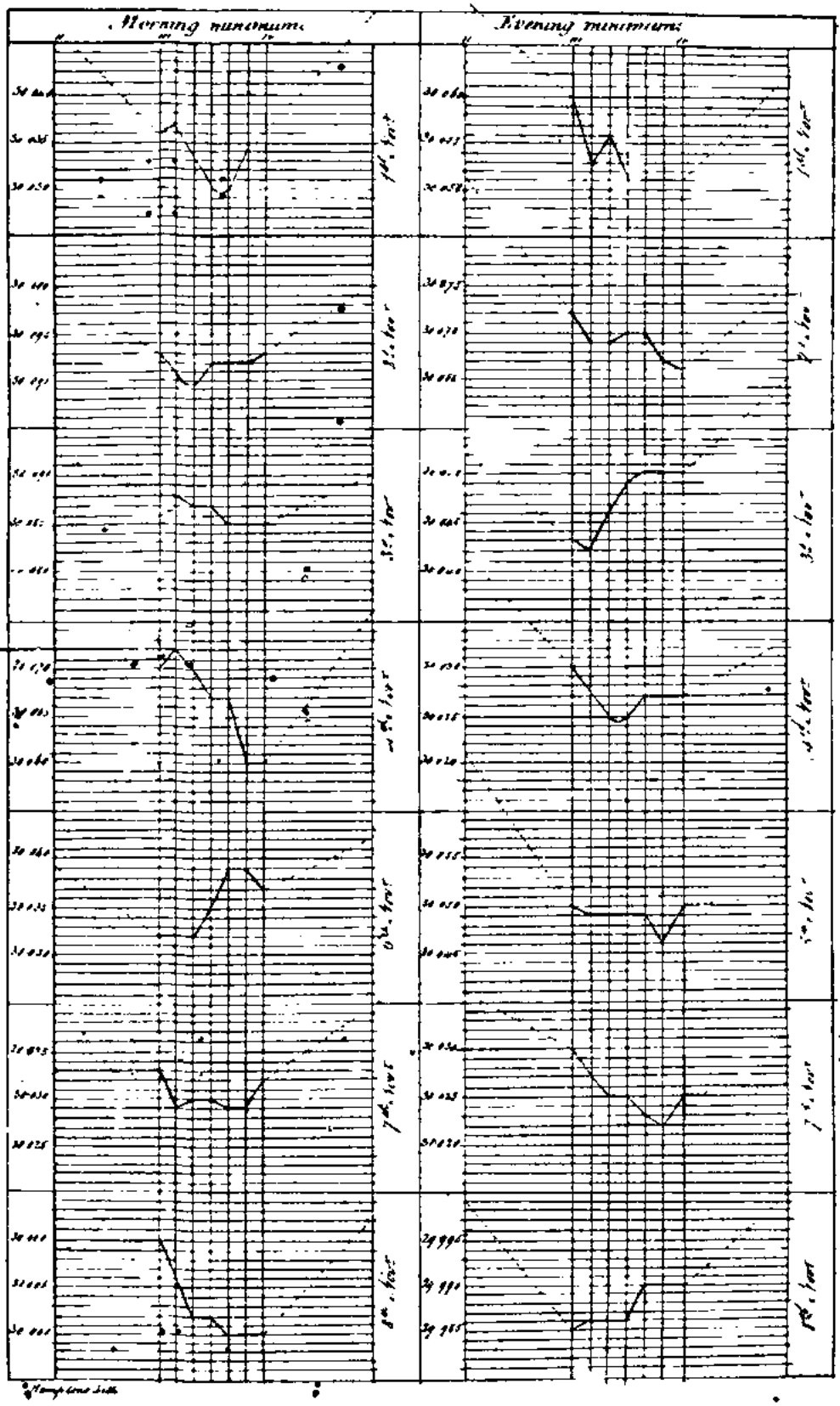
"*The righteous gift of a symbol and vehicle of the purified Saka Saka*, (Shakra or Indra†) *the resting place of the giver.*"

Saka in Sunskrit is the usual appellation for *Salivahana*, as *Sakya* is that for *Buddha*, being a title implying sovereignty : but in the present inscription *Saka-saka* is evidently intended for *Sakra*, the Sanskrit name for *Indra*, or the god of the firmament, who is named in Pali. *Sakko*. Two copies of the above inscription are here given ; and while Mr. Westergaard's would give the reading *Maha Raja*, I prefer that in Mr. D'Ochoa's—*Maha ratha* as being more consistent with the sense of the passage, and implying that water, over which it is inscribed, is the great vehicle of *Indra* ; who, in the inscription from the Khandagiri

* See Mr. Upham's account of the Bali in Ceylon, chap. x.

† शक्र Shakra, a name for Indra, the ruler of Swerga or Paradise.


Morning maximum
Evening maximum


Morning minimum
Evening minimum

rock, (Prinsep's Journal 1837, page 1080,) is styled *Maha-megha-vahana*, or the great one borne on the clouds. This last title, according to the *Tantra* portion of the *Kahgyur*, or Bauddha scriptures of Tibet, (Prinsep's Journal vol I. p. 389) is also given to a *Buddha*, in subjection to whom the *Nagas*, or serpents, are assigned the charge of the rains.

Not many years since surprise was expressed that figures common to the Bauddhas and Brahmans should have been found in the *Indra Sabha* at Ellora ; but with our present extended knowledge of the principles of both religions, and the testimony of Bauddha inscriptions that the latter system, like that of the Brahmans, admitted the worship of *Indra* and the elements, we can easily account for the ultimate approximation, (as exhibited in the caves of Ellora,) of systems originally distinct.

The last inscription which is given by Mr. D'Ochoas' plate, and not inserted in Mr. Westergaard's, is not quite so distinct as the others, and I am therefore doubtful of its real meaning. It may perhaps be read,

Raddhasavahanya satasattamsugata danam ;

And translated,

"*A gift to the vehicle of Raddha* (the perfect one) *the Sugata (Buddha) eternally gone.*"

ART. VII. — *Meteorological Observations.* By DR. BUIST.

DR. MALCOLMSON, *Secretary to the Bombay Branch of the Royal Asiatic Society.*

SIR,—I have the honor to enclose a paper of miscellaneous remarks on observations, now in progress at the Observatory, which seem likely to establish several laws in reference to atmospheric pressure, which have hitherto been mistaken or overlooked.

The first of these erroneous impressions is, in reference to the period of extreme pressure ; which seems to be at least an hour earlier than is generally supposed. The second, that the Barometer does not, as usually imagined, attain its extreme point of maximum, and then, after a pause of definite duration, return on its path ; but oscillates to and fro

for the space of nearly an hour before it begins steadily to return from the point of maximum or minimum range.

It seems likely to be made out, by further observations, that those oscillations follow a definite law, connected with the various seasons of the year.

The observations extend over much too limited a period to permit me to lay down any general law, established by them beyond controversy, and as yet they are to be esteemed provisional only, and are little calculated for publication: and I have taken the liberty of troubling you with them now, because the uncertainty of my tenure of office, at the Observatory, may by and bye preclude me from having access to its records.

I have the honor to be, Sir,

Your most obedient Servant,

GEO. BUIST.

There are few points on which the opinions of mariners are more conflicting than on the subject of the absolute value of indications, which Meteorological instruments give, relative to atmospheric changes in the more tranquil portions of the tropical ocean, rarely visited by storms more violent than the gales attending the change of the monsoon, and which are more or less prevalent throughout the rainy season. Amongst the navigators chiefly voyaging to the north of the line, and betwixt the coasts of Africa and India, the Barometer itself is very little heeded. The most striking illustration of indifference to this subject is to be found in the fact, that while the ships of the Royal Navy are provided with Meteorological instruments, almost as invariably as with an anchor or cable, a compass or charts,—and no really well found merchantman ever goes to sea without them, — the Indian Navy, mustering thirty armed vessels in all, of which one-half are steamers, are (unless in the case of those which have been built and fitted up at home) almost totally destitute of Meteorological instruments of any description: and those which have been provided with Barometers from the Company's stores had, considering their quality, almost as well be without them.

The reasons assigned for the general disregard of the marine Barometer in these seas are, that its indications are not trustworthy,—that it hardly seems to stir on the approach of a storm, unless this amounts to an actual hurricane. The Sympiesometer is put aside for purely the opposite reasons that it is too sensitive; — that it keeps the

mariner in a constant state of alarm;—and that when it sinks most rapidly no such result as that which was apprehended, ever ensues. The neglect with which this valuable instrument has been treated by the Committee of the Royal Society, on Physics including Meteorology, and who have excluded it from the list of instruments directed to be kept at all Magnetic Observatories, has unhappily given countenance to the disregard with which the Sympiesometer is treated within the tropics; but I shall, I trust, be able to show that there is a strong probability that by its use, the best established, striking, and inexplicable facts in Meteorology,—the hour of the occurrence of the maxima and minima of atmospheric pressure, indicated by the semi-diurnal fluctuations of the Barometer, will receive, as to matter of time, a very material modification.

It is stated by the Baron Humboldt,* on the authority of Mr. Horsburgh,† that during the rains the indications of the atmospheric tides are occasionally interrupted altogether; and, that, though manifest on the open sea, they vanish all along the coast. Our experience at the Observatory is so completely at variance with this, that throughout the monsoon during the past two years, when hourly observations have been most carefully conducted, we have found the atmospheric tides at all times as distinct and regular in their appearance, and nearly as considerable in their range, as during the steadiest weather in the fair season. At Poonah during the rains, I carried on a series of hourly observations for three weeks continually, during part of August and September 1841, and found the tides in a great measure independent of the weather.

The hours of maxima are betwixt 9 and 10 A. M. and P. M., and of minima betwixt 3 and 5 A. and P. M., and amongst the desiderata especially pointed to by Humboldt is the determination of the precise moment when the mercury reaches its maximum elevation, the length of time when it remains there, and the instant at which it begins to descend. In furtherance of this enquiry, a series of observations, commencing 10 minutes before 9 and terminating 10 minutes after 10 A. M. and P. M., in like manner in reference to the hours of maxima and minima, has just been commenced, from which the unexpected fact has been elicited, that the Barometer, instead of attaining a definite point, and then, after a period of repose, returning on its path, oscillates for the space of nearly an

* Personal Narrative, vol. VI., Part II., p. 706—English Edition, 1826.

† Nicholson's Journal, Vol. XIII., p. 20.

hour backwards and forwards. These oscillations, in all likelihood, follow some definite law, which it will at all events require the observations of a twelve-month to demonstrate. The subjoined curves give the results of the last eight days' observations, corrected for temperature, capillarity, &c., and read to thousandths of an inch. The remarkable fact to which I propose directing attention, refers to the indications of the Sympiesometer, which, in steady weather, invariably rates its maxima and minima at least an hour before the Barometer. To say that this arises from the superior sensitiveness of the instrument, is to conceal a most important fact under unmeaning common place. Of course it is from this the manifestation arises, but then the manifestation itself proves that the periods of greatest and least pressure, as assumed from barometric observations only, have been set down an hour too late by meteorologists: that instead of the former being from two to three hours, they are from three to four hours before noon and midnight; and instead of the latter occurring from four to five hours, they happen within three or four hours after these periods respectively. Both of these statements are of course to be received with this much of caution—that as yet they are based on a very limited number of observations, though these, as far as they go, are in a great measure free from anomalies. I have now commenced a series of observations on the Sympiesometer, conducted with similar frequency to to those on the Barometer; so that while throughout the day and night we shall have hourly observations without interruption, we shall for 8 hours out of the 24, have readings of both instruments taken with the utmost care every ten minutes.

Should the results of these be as hitherto, not only will an important fact be added to our stock of information on a subject which has of late been matter of special attention,—through the means of an instrument hitherto too little consulted on the more rigorous portions of research,—but the system of observation now commenced, may probably evolve in some definite and systematic form, the amount of interval generally intervening betwixt the pressure of the air as indicated by the mercurial column and the same thing as made manifest by the oil of the Sympiesometer.

To revert to the subject with which these observations opened:—the distrust, from opposite causes, manifested by mariners, in the eastern seas, in the two instruments under consideration, arises, in the first place,

from the extreme imperfection of the Barometers supplied on board of ships. Many seldom read, even by help of a vernier, lower than hundredths of an inch,—and that often so inaccurately that the vernier itself will hardly give precisely the same readings at any two points of the scale: they are destitute of all means of pointing out the neutral or zero point in the cistern, as well as for making corrections on account of expansion. Beyond the tropics these imperfections are comparatively little felt: there the casual range amounts to betwixt two and three inches, here it is seldom one-tenth of this; here, again, our daily range often exceeds a tenth, there, it rarely gets beyond a hundredth; here, our daylight range is about double, there, it is scarcely half that nearest the hours of darkness. The Barometer here, if properly constructed, may equally subserve the requirements of the mariner when its signs are understood, though these signs be different entirely from those which it elsewhere gives out. So with the Sympiesometer: it occasions alarm from the very circumstance of its sensitiveness which ought to be considered its great recommendation. It is occasionally employed in place of the Barometer, and is always compared or contrasted with it—not with the view of attaining any sound result, but to show how little is to be got out of it, because the language it employs and the tones in which it speaks, are different from those of its mercurial neighbour. When the Barometer whispers, the Sympiesometer shouts or screams; when the former is silent, the latter whispers: but what of that, if we know how to interpret them—if we avoid mistaking vivacity for folly, and take the indications in the shape they are given, and for as much as they are worth.

If these errors be avoided in coming to the conclusions desired to be attained, the two may form an invaluable combination, when a little careful observation shall have shewn us the precise value of the indications of the one when converted into corresponding expression of the other.

With a view to assist in carrying out these latter ends to some practical available purpose, amongst the shipping of our port, I some time since addressed one of the best of our meteorological instrument makers on the subject — Mr. Adie, of Edinburgh, by whom I have been very extensively supplied since my arrival here; and found that the very finest marine Barometers, free of all the defects above adverted to, with the means of obtaining all the requisite corrections for the most delicate ob-

servations, and with scales reading to thousandths of an inch, could be had in numbers betwixt five and six guineas—Sympiesometers of similar quality being procurable for like price.

ART. VIII.—*Bibliothæcal notices of important book collections in India and the East.* By THE SECRETARY. NO. I. MIYAN MAHOMED PANAH'S ARABIC AND PERSIAN LIBRARY AT KACH-BHUJ.

While much has been done to illustrate the civil and natural history of this great and extensive country, much yet remains for individuals to effect in bringing, into one well digested summary of information, the scattered subjects of knowledge we now possess, relative to the Antiquities, Geography, Palæography, Philology, religious and civil History of this and the neighbouring countries of Asia. We can scarcely indeed fail to observe that, wherever in the East we may be located by circumstances, abundant subjects of interest present themselves for investigation; and that the traveller, least learned in antiquities or languages, can, by copying inscriptions or obtaining lists of book-collections, supply abundant materials for the exertions of others. It is generally believed, and not without foundation, that while large and important collections of books on Sanskrit, Arabic, and Persian literature, have been carried to Europe, many now existing collections, in India and the East, pass unheeded by resident Europeans, or are barely known. A rare and valuable collection of Arabic authors, particularly those relating to the crusades, is said to be kept in the mosque of *Omar* at Jerusalem; extensive libraries of books, on the subject of the Jaina faith, have been described by Colonel Tod, as existing at Jessalmir and Anhalwara Pattan; and like important libraries, relative to the Bauddha religion, are to be found in Tibet, Ceylon, and China.

In devoting part of this Journal, to the head of *Bibliothæcal notices*, we trust the Society may be favored with as many communications on the subject of Indian book-collections in Sanskrit, Prakrit, and Persian, as may be in the power of gentlemen, variously distributed over the country, to give. Such will supply the Orientalists of Europe with *desiderata* long looked for, and may prove of utility to officers in the

service, who devote their leisure time to the illustration of yet obscure points in the religious opinions and history of India. Should we be supplied with descriptive catalogues from various parts of the country, we will be happy to make known the labours of our correspondents on such subjects; and in the absence of better information, we now insert a list of the books composing the Arabic and Persian library of the deceased Miyan Mahomed Panah, which was kindly supplied many years ago by Captain Postans, and is well worthy the attention of those wishing to have copies of such books.

Theology.

A. *Commentaries on the Kuran, chiefly Arabic.*

No. 1 تفسیر کشاف دو جلد

Tafsir Kashaf, in two volumes. Author's name is not mentioned, but this is a Persian translation and commentary on the most esteemed of Arabic commentaries on the *Kuran*, namely the Kashaf, which was written at Mekka sometime about A. D. 1143: and the author of which was Imam Abul-Kasim, the son of Omar-al-Zamakhshary.

No. 2 حاشیهٔ سیّد یمنی بر کشاف یک جلد

Marginal notes on the Kashaf by Saiyad Yemani, in one volume.

No. 3 ایضاً حاشیه کشاف یک جلد

Marginal notes as above; one volume.

No. 4 حاشیهٔ سعد الدین تفتازانی بر کشاف یک جلد

Hashiya Kashaf Saad-ad-din Tuftazani, one volume.

The author of this well known commentary was Saad-ad-din, the son of Masaud-bin-Omar Tuftazani, who died A. D. 1389.

No. 5 تفسیر بیضاوی چهار جلد

Tafsir Baizawy, four vols.—The light of revelation, being a Persian translation of, and commentary on the *Kuran*, according to the *Sunny* faith. The author of this work was Nasir-ad-din Abu Said Baizawy, Kazy of Shiraz, who died A. D. 1292.

No. 6 تفسیر مدارک سه جلد

Tufsir Mudarik, in three vols.—This is an esteemed Arabic commentary on the *Kuran*, by various authors.

No. 7 تفسیر معالم التنزیل دو ربع

A commentary on the truths of the world above, as explained in the Kuran.

No. 8 تفسیر انوار التنزیل و اسرار التاویل یک جلد

A commentary on the lights of revelation, and the secrets of dreams, in four vols. the author's name not mentioned.

No. 9 تفسیر جلال الدین کهنه یک جلد

A commentary by Jalal-ad-din Kohnah; one vol. This, as would appear, is the commentary on the Kashaf, written in Egypt by the celebrated Shaikh Jalal-ad-din-as-Saiyuti.

No. 10 تفسیر وچیز یک جلد

Another commentary with additions on other subjects.

No. 11 تفسیر سعدي ربع اخر ایک جلد

Another commentary not described.

No. 12 تفسیر اصمعي برسورهٔ یوسف یک جلد

Another commentary, and not described.

No. 13 تفسیر نیشا پوري تما م یک جلد

Tafsir Naishapuri, one volume not described.

No. 14 ایضا نیشا پوري یک جلد

Another commentary as above.

No. 15 قران مجید خوش خط پنج جلد

The Kuran of the mosque in fine writing; five volumes.

No. 16 ترجمهٔ قران مجید نصف اول فارسے

The translation of the above into Persian; the first half completed.

No. 17 تفسیر حسینے چهار جلد

Tafsir Hussainy. A Persian translation of, and commentary on the Kuran, according to the Shiah copy.

There are other nineteen volumes of various commentaries, which being of no great note need not be described.

B. *On the science of reading the Kuran.* قسم گویم در علم قراءت

In this division there are ten small volumes and treatises of various

kinds on the science of reading the Kuran, performing the necessary prostrations, and pronouncing the *Khutbah*, or oration and prayer delivered every Friday for the reigning king.

C. *Traditions.* قسم سيوم علم حديث

No. 18 صحيح بخاري يک تمام ويک نصف جلد

Sahih-al-Bokhary. This book, next to the Kuran, is considered an authority in spiritual and temporal matters; and embodies the traditions, relative to the revelations, actions, and sayings of the prophet Mahomed. It also enumerates the miracles, and relates anecdotes of the ancient prophets. One volume is complete, and of the other there is only one half. The author of this celebrated work was Abi Abdallah-bin-Ismail-al-Bokhary, who died A. D. 869.

No. 19 نصف اول صحيح مسلم دو جلد

Sahih Muslim, in two volumes, being the first half of the work. This is a collection of traditions, by Muslim-bin-Hijay Naishapury, who died A. D. 874.

No. 20 مشكوة شريف تمام كمال يک

Mushkat Sherif complete. This is a commentary on the *Masabih*, of Abu Mahomed-ibu-Masaud-al-Baghavi, who died A. D. 1122. Besides the traditions relative to the prophet Mahomed, it embodies portions of ancient history. The author was Shaikh Wali-ad-din Abdallah, the son of Abdal Hamid of Tabriz.

No. 21 مشكوة شريف نصف نصف چهار جلد

About one half of the four volumes of the above work.

No. 22 مصابيح بخط جديد

The Misabih of Abu Mahomed-ibn-Masaud-al-Baghavy.

No. 23 شمايل نبوي

Shamail Nabuwi, in two volumes. These contain the memoirs of Mahomed.

No. 24 كنوز الحقايق

Kanz-al Hakaik, or the treasurers of truths. This may be probably the same work as the *Kanz-al-Amil* of Stewart's Oriental catalogue, and if so contains anecdotes of the ancient Arab tribes, and the descrip-

tion of several places in Arabia. Moeller, in his oriental catalogue of the Duke of Sax-Gotha's library, at number 133, describes a book called *Mifatih-al-Kanuz* or the *Keys of the Treasurers*, which appears to be a commentary on the work described under the present number.

No. 25 حصن الحصين شش جلد

Hisni Hussin,, or the impregnable fortress, in six volumes. This is rather a book of prayer than traditions.

No. 26 خلا صته السير وچهل حديث

The *Chahel Hadis*, or the forty proverbs and aphorisms of the prophet Mahomed.

No. 27 اربعين حديث بترجمه فارسے دو جلد

A Persian translation of the above work.

No. 28 چهل حديث نووي وبرهان الغافلين در يک جلد

The *Chehel Hadis*, and *Burhan-al-Ghafilin*, or the forty traditions and guide to the thoughtless in one volume. The last is probably the same work as the *Tanbih-al-Ghafilin*, or warning to the thoughtless, of which the author is Abu Leis Samarkandy.

No. 29 مفاتح الجنان شرح مصابيح

The keys of the Genii, or a commentary on the Masabih; author's name not mentioned.

No. 30 منراج الطالبين ومنهاج الراغبين

This is usually known by the name of *Minhaj Al Talabin*, a work on scholastic theology, relative to religious duties, written by Muhye-addin Al Nawavi, with explanation of the names of places and words occurring in the book, by his son and commentator called *Siraj-ad-din Omar*, who wrote between 743——758 Hej or A. D. 1342—1356.

No. 31 شرح فارسے حصن الحصين دو جلد

A Persian commentary on the *Hisni Hussin*, already described.

No. 32 ترجمه فارسے حصن الحصين

A Persian translation of the last work.

No. 33 غرايب الحكايت

Ghuraib-al-Hakayiat, or extraordinary stories, which appears to be the same work as that called *Majmaa-al-Ghuraib*, or the collections of wond-

ers, which contains the traditionary history of *Balkh* and the *Sassanides*, with the first conquests of the Mahomedans in Khorasan.

No. 34 لبا لب الاخبار بترجمه فارسی

Lubab-al-Akhbar, being a collection of traditions, containing moral and religious advice to kings.

No. 35 جامع الحکایات خلاصته الاحکام دریک جلد

The first work in this collection has been already described, being as would appear, the same with the *Gharaib-al-Hakayat*. The author was Hussain-bin-Asad, who dedicated it to Mahomed Taher, the IV of the Taherites of Khorasan, who lost the throne about Hej. 259 A. D. 872: and at a period when the history of *Balkh* and the *Sassanides* must have been well known to the inhabitants of these countries.

In the above division there are fifty two other works of the same kind which we need not now describe.

II. Jurisprudence. قسم دویم درعلم فقه

No. 36 ادب المتعلمین امام محمد غزالی

Adab-al-Mutaalamin, or the duties of the learned, known as the work of Mahomed Ohazzali, a celebrated Mahomedan doctor of law. This is the same work described by Moeller in folio, No. 171, in the Duke of Saxe-Gotha's library; and again, by De Lacy, in the national library of France, (see Chrestoniathie Arabe Tome III p. 133).

No. 37 هدایه تمام یک جلد

Hedayah, complete in one vol. This work which is generally used in the English Mahomedan law courts of India, was written by Shaikh Burhan-ad-din Ali of Marghinan, in Transoxiana, about the year A. D. 1135. It is a digest of the most approved works on Mahomedan Jurisprudence.

No. 38 بحر الرایق جلد اول سیوم

Bahar-al-Dakaiyak, the first and third volumes of the work. This is a well known commentary on the work of Hanifah, commonly called *Kanz-al-Dakaik*, or the treasure of subtleties.

No. 39 معدن الحقایق شرح کنز الدقایق

Maadam-al-Hakaik, or the mine of truths. This is another commentary on the *Kanz-al-Dakaik*, similar to the above.

No. 40 فتاوي عبد الله از اول نا قص

Fatawah Abdallah, wanting the beginning. This is the work of Mahomed Abu Abdallah Badr-ad-din-Zerkashi, written in Hej. 873, A. D. 1468.

No. 41 فتاوي عالمگيري

Fatawah-Alamgir, the judicial ordinances of Aurangzeb.

No. 42 فتاوي خلاصه الفقه نصف اول

Fatawah Khulasah-al-Fikh, the ordinances, or an abridgement of law; of which there is only the first half.

No. 43 مجمع البحرين شرح قدوري

Majmaa-al-Bahrain, or the junction of two seas, being the same as the *Kitab-al-Bahrain* No. 119 of Moeller's catalogue. It is a commentary on the work of Ahmad-bin-Mahomed Kaduri, who died A. D. 1049. The work of the latter is called *Adab-al-Kazi*, or the duties of a magistrate.

No. 44 بدر المنير شرح جامع صغير

A commentary on the smaller body of traditions contained in the work of *Jalal-ad-din As Saiyuti*. It is the same as No. 71 of Moeller's catalogue.

No. 45 كنز الدقايق

Kanz-al-Dakaik, a copious digest of the Mahomedan law, according to the doctrine of Imam Abu Hanifah, one of the great law doctors of Mekka, who died A. D. 767. The author of this work was Imam Abdal-Barkat Ata Allah-bin-Ahmad Hafiz-ad-din-Nessafy, who died A. D. 1310.

No. 46 مجموعه خاني سه جلد

Majmui Khani, a treatise on the duties of prayer, purification, and alms, illustrated by quotations from the Kuran. The author was *Kamal* who wrote during the reign of the Emperor Akbar.

No. 47 روض الفايق

Rauzat-al-Faik. This is a law book, according to the doctrine of the Imam Shafai, written, at Damascus by Kazi Zakaria about A. D. 1271.

No. 48 مقامات حريري

Makamati Hariri, a work containing oratorical and moral discourses

by Abu Mahomed Kasim, the son of Ali-bin-Osman Hariri of Bassorah, who died A. D. 1121.

No. 49 شرح كفايه

Sharah Kafaiah. —This is a commentary on the Hedayah,—written by Imam-ad-din, the son of Amir Ali.

No. 50 شرح مواهب

Sharah Muahib. — This appears to be improperly included among the law books, as it is a commentary on a work which comprises a history of the first forty years of the prophet Mahomed's life, previous to his assuming the prophetic character.

No. 51 كتاب فقه در مذهب شافعي

A book of law agreeably to the doctrines of *Shafai*, one of the four learned doctors of Mekka.

No. 52 قدوري

Kadury. — This is the work called *Adab-al-Kazi*, or the duties of a Magistrate, which has been mentioned under a former number.

No. 53 تحفته النصايح

Tohfat-al-Nasayah.—Another commentary on the work of *Kaduri.*

No. 54 شرح سراجيه

Sharah Sirajiah. — This is a treatise on the law of succession and inheritance : by the author Siraj-ad-din Sejawandi.

No. 55 مجموعه فرايض

Majmuai Faraiz, or a compendium of law regarding inheritances.

No. 56 توضيح

Tauzih. — This work is an illustration of the fundamental principles of the common law derived from the Kuran, and generally called *Asul*, or the roots.—Besides the books described in this class there are ninety three other works on the subject of law.

III.—Metaphysics and Rhetoric. كتاب علم معانے وبيان

No. 57 تلخيص

The *Talkhis.* — A celebrated work on Metaphysics and Rhetoric, by

Jalal-ad-din Katib Damashki, a native of Kazwin in Persia, who died A. D. 1338.—It is a commentary on the *Miftah-al-Alúm*, or the key to the sciences, written about A. D. 1228.

No. 58 مطول

The *Matuwal.* — This is a diffuse commentary on the *Talkhis*, the work described under last number.

No. 59 حا شیه مطول

Hashiah Matuwal.—Marginal notes on the above work.

No. 60 شرح تلخیص

Sharah Talkhis.—A commentary on the *Talkhis.*

No. 61 عبد الحکیم حاشیه مطول

The marginal notes of Abdal Hakim on the Matuwal.

No. 62 هد ایة الحکمته

Hadayah-al-Hikmat; or the guide to Philosophy, by Ibn Asir, and containing essays on Logic, Metaphysics, and other branches of knowledge.

No. 63 حکمت العین

Hikmat-al-Ain, or the fountain of wisdom, an esteemed treatise on general Philosophy, written by Najam-ad-din Kazwini, who was the friend of the celebrated Nasir-ad-din Tusy, who lived about A. D. 1277.

No. 64 شرح حکمته العین

Sharah Hikmat-al-Ain, a commentary on the above work: author's name not given.

IV. MEDICINE, AND NATURAL PHILOSOPHY. کتا بها ي علم طب وحکمت

No. 65 میزان طب

Mizani Tib, or the balance of nature, containing treatises on heat, cold, drought, moisture, and pregnancy.

No. 66 مختصر الطب

Mukhtasir-al-Tib.—This is not described, but is probably an abridgement of the work of *Jalinus* or Galen.

No. 67 تحفتہ المومنین

Tohfat-al-Mominin, the complete science of medicine, compiled, from Arabic and Sanskrit, by Mahomed Momin of Delim.

N. 68 قرابا دین

Korabidin, or a dispensatory : author's name not mentioned.

No. 69 جامع الفواید

Jamaa-al-Fawaid, or a compendium of Physic.

No. 70 کفایتہ منصوري

Kifaiyat Mansuri : being an exposition of the disorders to which the human frame, and particularly that of females is liable, with an essay on the management and care of children : by the author Mahomed Mansur of Delhi ; written about A. D. 1300.

No. 71 قرابا دین وزخیرہ خوارزم شاهي

Korabadin wa Zakhirah Khwarism Shahi.—A dispensatory and the Royal Treasury of Khwarism.—This is an esteemed general treatise on medicine, embracing the means of preserving health, and acquiring a knowledge of diseases. — It treats of fevers, local complaints, surgical operations, eruptions of the skin, poisons, and medicines.— The author was Ismail the son of Hussain, the son of Mahomed Jurjani, who wrote A. D. 1110.

No. 72 قانونچہ عربے

Kanunchah Arabi; the canons of medicine. — This work is undercribed in the list sent me by Captain Postans ; but it is probably the same as the *Kanun-fi-al-Tib*, or the canons of medicine, by Abu Ali Hussain, the son of Abdallah-bin-Sina, generally called Avicenna, who was born at Bokhara A. D. 980, and died at Hamadan A. D. 1037.

No. 73 راحت الانسان

Rahat-al-Insan. — A general treatise on medicine, containing prayers and charms for averting sickness.

No. 74 اختیارت بدیع

Ikhtiarati Badia. — This work contains a list of medicines, simple and compound, and describes their various uses, — It was written by Ali-bin-Hussain of Baghdad.

No. 75 مجموعة الصنايع

Majmuah-al-Senaye, or the repository of arts; describing the manner of making artificial gems, colours, fireworks, dying cloths and silks, &c.

No. 76 تجربات شاهي

Tajirrabat Shahi. — This is probably the work of Mahomed Mehdi on practical medicine, written A. D. 1756.

There are fifteen other works in this class, of which we omit the description.

V. ETHICS AND SUFYISM. كتاب علم تصوف و سلوك

No. 77 چهل كتاب

Chehel Kitab, or the whole duty of a Sufy student, in forty chapters, by the author, Shaik Mahomed.

No. 78 شرح غوثيه

Sharah Ghausiah. — Essays on the world, futurity, and approximation to the Divinity, according to the Sufy doctrines: by the author, Abdul Kadir Jilani.

No. 79 كيمياي سعادت

Kimia-i-Saadat, a general System of Ethics, by the author of the Ahiya. The author was the celebrated Imam Mahomed Ghazali, of Tus or Meshid, in Khorasan. This was one of the favorite books of the Emperor Akbar.

No. 80 نشاط العشق

Nishat-al-Ishk. — An exposition of the Sufy doctrines and regulations, by the author Abdallah Ansari.

No. 81 رساله عادل شاهي

Risalah Adil Shahi.—This work is not described, but must be, from its name, the production of one of the kings of Bijapur, or was written under their reign.

In this class, books of prayer, fundamental principles of faith, and poetical works on Sufyism, have been ignorantly blended into one list: in which fifty or sixty works are enumerated, that need not be described.

VI. GRAMMAR, LOGIC, AND PHILOLOGY. كتاب صرف و نحو منطق و لغات

No. 82 جاربردي شرح قافيه

Jarbardi Sharahi Kafia.—A commentary on the celebrated Arabic work on Syntax, by the author Jamal-Ad-din.

No. 83 مجموعه منطق

Mujmuai Mantik, or a compendium of Logic; the author's name not mentioned.

No. 84 ترجمه قافيه ميرسيد شريف

A translation of the Kafiah, by Mir Saiyad Sharif.

No. 85 شرح شافيه

Sharah Shafiah, a very celebrated and scarce treatise on Arabic Grammar, by Nizam-ad-din Bin Hussain.

No. 86 ميزان منطق

Mizani Mantik, or the balance of logic.

No. 87 كافيه

The celebrated Arabic treatise on Grammar called the Kafiah.

No. 88 حاشيه شرح ملا

Hashiah Sharahi Mulla, or marginal notes on Jamís, commentary on the Kafiah.

No. 89 شرح ملا

Sharahi Mulla. Jamís commentary on the Kafiah.

No. 90 حاشيه عبد الغفور

Abd-al-Ghafur's marginal notes on Jamís commentary.

No. 91 وافيه شرح كافيه

Wafiah Sharah Kafiah. A celebrated commentary on the Kafiah by Jamal-ad-din Amru Osman, the son of Amru, the son of Abubikr, the son of Yunis Almisri, of Egypt, commonly called Ibn Hajib, who died A. D. 1243.

No. 92 تهذيب المنطق

Tahzib-al-Mantik, or the quintessence of Logic, a celebrated treatise on this subject by Saad-ad-din, the son of Masaud-bin-Omar Tuftazani, and author of a commentary on the Kuran, already described.

No. 93 صراح

Surah-al-Loghat, an abridgement, with explanations in Persian, of

the Sehah-al-Loghat, which was translated by Golius, into Latin. This is a most useful dictionary of the language, by the author Abul Fazl Mahomed, the son of Omar, the son of Haled-al-Koraishi.

No. 94 صحاح

Sehah-al-Loghat, a very ancient dictionary of the Arabic language, and translated into Latin as just mentioned.

No. 95 شرح نصاب الصبيان

Nisab-al-Sibyan, or an introduction to the study of the Arabic language, for the use of the young.

No. 96 فرهنگ رشيدي

Farhang Rashidi, a most useful Persian Dictionary, giving the correct pronunciation of each word. It was dedicated to the Emperor Shah Jahan, by the author Abdal Rashidi, the son of Abdal Ghafur-al Husseni.

There are forty other works under thus head, which cannot be now described, as they would occupy too much time and space.

كتابهاي نجوم ورمل وهياة

VII. Astrology, Genomacy, and Astronomy.

No. 97 ملخص درهياة

Malakhas-dar-Hayat, or an abridged treatise on Astronomy.

No. 98 كشف الاسرار دررمل

Kashf-al-Asrar dar Raml, or the disclosure of secrets by Geomancy.

No. 99 كتاب درعلم اسطرلاب

Kitab dar Ilmi Astarlab, or a book on the science of the Sphere.

No. 100 مفتاح الرمل

Miftah-al-Raml, or a key to Geomancy.

No. 101 كتاب ذكر ذكر افلاك

Kitab dar Zikri Aflak. A book on the history of heavens.

There are three other works belonging to this class, not here enumerated.

VIII. History. كتابها ي تواريخ

No. 102 جذب القلوب

Jazb-al-Kalub, a history of the city of Medina, and of Mahomed's Tomb, &c. by the author, Abdal Hak.

No. 103 حبيب السير نصف اول

Habib-as-Sair. The history of Mirkhond, the first half complete.

No. 104 هفت اقليم د رد وجلد

Haft Iklim. A geographical and biographical treatise, by Amin Ahmad Razi; in two volumes.

No. 105 روضتة الصفا

Rauzat-as-Saffa. — This is the most esteemed history in the Persian language, and if complete is invaluable.

No. 106 قصص الانبيا

Kissas Al Anbia. — An account of the creation of the world, and a history of the prophets preceding Mahomed: Author Ibraham-bin-Ismael.

No. 107 نفحا ت الانس

Nafahat-al-Ans. — The celebrated abridgement of the Arabic Tabkat-al-Sufieh, or lives of the Sufy Shaikhs, by the poet Jami.

No.108 مطا لع الانوار د وجلد

Mutlaa-al-Anwar. — Anecdotes of the prophet Mahomed, describing his mode of life, by the author Abdul Hak, who appears to have been a cotemporary of Ferishta. It is on the authority of this work Ferishta asserts, in his introduction to the general history of India, that the Afghans are descended from a race of Copts.

No. 109 روضتة الشهدا

Rauzat-al-Shohada, or the garden of martyrs, describing the murder of Hussain, and the battle of Kerbela.

Besides the above works there are twenty in this class which have not been described; ninety four different works of poetry and fables, and several books translated into the language of Sindh and the Panjab. In fine it is one of the most complete extant libraries on this side of India.

ART. IX.—*Extracts from the Proceedings of the Society.*

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in the Library Rooms on the 10th January, 1844.

The Hon'ble G. W. Anderson, President, in the Chair.

It was proposed by the Hon'ble the President, seconded by Dr. James Burnes, K. H. F. R. S. Vice President, and the Secretary, and was carried unanimously,—That the name of Sir Jasper Nicolls, K. C. B. one of the founders of the Society, be placed on the list of Honorary Members.

Dr. James Burnes, K. H. Vice President, read a paper, illustrated by drawings, on the anatomy of the Sindh mosquitoe, by J. H. Charter, Esq., Assistant-Surgeon, a Member of the Society.

A paper on the tenets of the Armenians, by R. H. Murphy, Esq., was also read.

Dr. Burnes, K. H. Vice President, presented a brass image, holding a club and bearing an inscription on its breast, which had been found at Babylon by Mr. Assistant Apothecary J. Anderson, of the Euphrates Flotilla. A number of engraved gems, found at the same place, and transmitted by Mr. Anderson, were presented at the same time.

The Transactions of the Agri-Horticultural Society of Western India, from 1839 to 1842, were presented by that Society.

An extract of a letter from Mr. Westergaard, Honorary Member of the Society, dated Tehran the 15th November, was read, stating that he had been able, with the aid of a fine telescope, to make a copy of the *Nakhshi Rustam* inscription never before copied; and of which a fac-simile had been sent to Major Rawlinson. The Secretary was directed to forward to Mr. Westergaard's address, at Copenhagen, a copy of the Yaçna and Visparad, as requested by him.

An extract of a letter from E. Blyth, Esq., of Calcutta, stating he had sent a skull of the *Gangetic Gariala*, for comparison with that of the Indus, was read: and several fossil specimens, recently discovered at Perim Island in the Gulf of Cambay, were presented.

The meeting adjourned to Wednesday the 14th February, 1844.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in the Library Rooms on Wednesday the 14th February, 1844.

The Hon. G. W. Anderson, President, in the Chair.

A letter was read, from Messrs. Longman and Co., stating that the copper plates of the three volumes of the Society's Transactions are in their possession, and mentioning the terms on which they are prepared to reprint the same Transactions, in 3 volumes 8vo. with a 4th volume of plates. It was thereon resolved — that the Secretary be authorized to enter into an engagement with Messrs. Longman and Co. for having the Transactions reprinted, in the form, and on the terms specified, provided subscriptions for one hundred copies, at 20 Rupees each copy, can be obtained: and that a subscription paper be accordingly circulated to every member of the Society.

A paper containing observations on the Geological composition of the hills and alluvial soil from Hydrabad to the South of the Indus, by Assistant Surgeon J. H. Carter, was also read: along with a further notice and drawing of the Sindh mosquitoe.

* A paper on the Iron Ore in the vicinity of Malwan, accompanied by specimens, presented by Ball G. Shastree, Esq., was also read.

Specimens of the wood of the Frankincense and Gum-arabic trees, were presented by Dr. J. P. Malcolmson of Aden: also of the plant which produces Dragon's blood, brought from the mountains of Africa, situated twenty miles inland from the coast, where the Government Steamer Memnon was lost. This interesting plant appears to belong to a new genus, allied to the *Dracænor* of the Cape-de-Verde Islands. Flowers and fruit of this plant, and of the Olibanum or Frankincense, would be important acquisitions to science.

The following works were presented to the Society viz.

By Charles D'Ochoa, Esq. Honorary Member, Orationes et Epistolæ Isocrates, Greek and Latin, Paris, 1521.

Raynard de Lally, Paris, 1758.

Copy of the printed report of the Botanic Garden at Calcutta, and three copies of the proceedings of the Board of Education for 1842, were presented by Government.

Letters from the Trustees of the British Museum, and the University-keeper of the Royal Library, Berlin, acknowledging the receipt of the Vandidad and Yaçna, were read.

The President announced his resignation of the Chair of the Society, in consequence of his being about to return to England; and expressed his gratification at having been elected to the honorable position he

had occupied, and announced his readiness to further the objects of the Society in England, or in whatever way he might be best able to do so.

It was thereon proposed, by Major General D. Barr, and seconded by James Burnes, K. H. Vice President,—That a special meeting for considering in what manner the Society can best express their sense of the late President's valuable services, should be fixed, by public advertisement, for Friday the 16th Instant.

The meeting then adjourned to Wednesday the 13th March 1844.

At a special meeting of the Bombay Branch of the Royal Asiatic Society held, in the Library Rooms, on Friday the 16th February, 1844.

PRESENT.

JAMES BURNES, K. H., F. R. S., Vice President in the Chair.
The Honorable Sir ERSKINE PERRY, Knight.

Members.

The Hon. L. R. REID.
J. P. WILLOUGHBY, Esq.
Lieut. Col. P. M. MELVILLE.
Maj. Gen. D. BARR.
W. HOWARD, Esq.
W. H. HARRISON, Esq.
A. SPENS, Esq.
JAMES BIRD, Esq., F. R. G. S.
The Rev. G. COOK.
M. CURSETJEE, Esq.
G. BUIST, Esq., LL. D.
F. SHEPPEE, Esq.
P. W. LEGEYT, Esq.
W. ESCOMBE, Esq.
H. FAWCETT, Esq.

The Rev. GEORGE PIGOTT, *Acting Secretary.*

The minutes calling the meeting having been read over, it was proposed by James Bird, Esq., seconded by James Burnes, K. H. *Vice President*:—

That the Society record their high sense of the obligations they are under to the late President, the Honorable G. W. Anderson, for the zeal and devotion manifested by him, on all occasions, in promoting the best interests of the Society; and especially for the ability and courtesy with which he has presided over their meetings since his elevation to the chair.

Resolved — That the Acting Secretary communicate this resolution to the Hon'ble Mr. Anderson.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in the Library Rooms on Wednesday the 13th March 1844.

The minutes of last meeting having been read and approved, the following Gentlemen, Cursetjee D. Pestonjee, Esq., E. M. Suart, Esq., of the Civil Service, and Lieut. W. S. Suart, Engineers, proposed at the last meeting, were balloted for and duly elected members of the Society.

Captain J. P. Saunders, I. N. was then proposed by Captain H. B. Lynch, K. L. S., I. N., and seconded by J. F. Morier, Esq., M. D. A Thompson, Esq., M. D., H. M. 14th Light Dragoons, was proposed by the Vice President Dr. Burnes, and seconded by James Bird, Esq.

It was directed that in the next circular, calling a meeting of the Society, notice be given that a President will be elected in succession to the Honorable G. W. Anderson.

A letter from Major General Vans Kennedy, accompanying a stone with an Inscription in the Hamaiyaric, or Ethiopic character, from Aden, was read.

* The Secretary laid on the table the concluding portion of the Rev. Mr. Menge's translation of Ehrenberg's treatise on the Coral Rocks of the Red Sea.

A letter from the Honorable G. W. Anderson, in answer to one from the Society thanking him for the offer of his services in England, was received and read.

The meeting then adjourned to Wednesday the 10th April next.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in the Library Rooms, Wednesday the 10th April 1844.

The Vice President, James Burnes, M. D., K. H., in the chair.

The minutes of last meeting were read and approved.

A Thompson, Esq., M. D., and Captain J. P. Saunders, I. N., having been balloted for, were duly elected members of the Society.

Captain H. James, 18th Regt. N. I., was proposed as a member by James Burnes, K. H., Vice President, seconded by C. Morehead, Esq., M. D.

Dr. Osborne was proposed as a member of the Society by J. F. Morier, Esq., M. D., seconded by the Rev. G. Pigott.

The following Resolutions being then proposed, at the meeting, by the Chairman, were seconded by James Bird, Esq., and carried unanimously.

1st. That the Bombay Branch of the Royal Asiatic Society, enter on their records an expression of deep and heartfelt regret for the loss of their Secretary, the late J. G. Malcolmson, Esq., M. D., F. R. S. G. S., a gentleman whose high integrity of character, generosity, warmth of heart, zeal in the promotion of science, and wide and varied acquirements, obtained for him the esteem and respect of all who knew him, and especially of the members of this Society, with whom he was in continual and gratifying intercourse.

2nd. That, with the view of perpetuating a record of these feelings towards the memory of that eminent individual, the Society accord yearly a gold medal, to be designated "The Malcolmson Medal," to the author of the best paper presented to the Society on the Natural History and Literature of India, — points on which the late lamented Secretary evinced the deepest interest.

3rd. That a fund be raised by subscription for the above purpose, among the members of the Society.

The Society then proceeded to the election of a President.

The amendment notified, proposing that the election be made by printed circular, having been rejected —

It was proposed by Dr. Bird, seconded by Colonel J. H. Dunsterville, and carried unanimously, — That the Honorable J. H. Crawford, be requested to accept the Office of President.

Proposed by James Burnes, K. H., seconded by the Rev. George Pigott and carried unanimously, — That Colonel G. R. Jervis be requested to accept the Office of Vice President of the Society.

Proposed by James Burnes K. H., seconded by A. B. Orlebar Esq. and carried unanimously, — That Dr. Bird be elected Secretary to the Society.

Proposed by the Rev. G. Pigott, seconded by James Bird, Esq., — That A. B. Orlebar, Esq., be elected Secretary for the Museum.

Read a letter from the Curators of the Dublin Geological Society, tendering an exchange of published proceedings, and announcing the despatch of a box of fossils of the carboniferous limestone and other Irish

formations, and requesting to be favoured with such Indian duplicates as the Society may be able to spare.

Resolved — That the exchange of proceedings be sanctioned, and the thanks of the Society be returned for the fossils despatched, and that the Secretary for the Museum be authorized to forward such duplicates as are available.

Read a letter from G. Buist, Esq., LL. D., in charge of the Magnetic Observatory, Colaba, forwarding, by direction of the Government, lithographed copies of the Meteorological and Magnetic Observations made under his direction, and suggesting that it would be advisable that one of the two copies granted by Government should in future be forwarded as issued monthly, and the other retained in the Observatory to the end of the year.

Resolved — That the thanks of the Society be returned to Government, and the suggestion of Dr. Buist adopted.

Read a letter, forwarded by the Secretary of the Board of Education, announcing the sanction of Government to the exchange of rooms now occupied by the Board of Education for those in which the Museum is kept.

Read a letter from R. Kirk Esq., forwarding a box containing varieties of Madrepore lava, from the Islands of Jibal-Tor, and other mineralogical specimens from the coasts of the Red Sea.

Resolved — That the thanks of the Society be returned to Dr. Kirk, for the above specimens.

Read letters from Professor Lassen, and Dr. Pertz, Principal Librarian, King's Library, Berlin, thankfully acknowledging the receipt of the copies of the Vandidad forwarded by the Society.

The Society direct that notice be given in the next circular, calling the monthly meeting, of the change of the day of meeting, from Wednesday to Thursday.

Dr. Buist read and presented some observations by one of the assistants of the Observatory to the late Secretary, on the springs of Vizrabhoy.

The thanks of the Society were voted for the above, and the meeting adjourned to Wednesday the 8th May next.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in the Library Rooms, on Wednesday the 8th May 1844.

The Hon. J. H. Crawford, President, in the Chair.

The minutes of the last meeting having been read and adopted, Captain H. James, 18th Regt. N. I. and Assistant Surgeon S. Osborne, were balloted for and duly elected members of the Society.

The following resolution, of which due notice was given, was proposed by Dr. Burnes, K. H., Vice President :—

That the day of the monthly meeting of the Society be changed from Wednesday to Thursday; and being seconded by Dr. G. Buist, was unanimously agreed to.

Read a letter from Assistant Surgeon Malcolmson at Aden, presenting, on the part of Lieut. Cruttendon, I. N., specimens of limestone from Ras Asser, where the *Memnon* was lost.

Read a letter from the Secretary to the Asiatic Society, Bengal, acknowledging the receipt of the Vandidad Sade, and offering the Society's services in any way calculated to forward the views, literary or scientific, of the Bombay Asiatic Society. The letter also announced that the Asiatic Society of Calcutta had been pleased to present to the Bombay Society the following works :—The Mahabarata, in Sanscrit, 4 Vols. large paper. Harywansa, 1 Vol. Ryl. 4°, Raja Tarangini, large paper, and the Naishada Charitra, 4°.

Read a letter from Colonel G. R. Jervis, acknowledging the receipt of the Secretary's communication that he had been elected Vice President of the Society, and expressing his high sense of the honor and his gratification in accepting the office.

The Society instructed the Secretary to forward to the Chief Engineer a copy of the letter from the Secretary of the Board of Education, relative to the exchange of rooms in the Town Hall, as sanctioned by Government, and to ascertain what would be necessary for carrying into effect the removal of the Society's Museum to the rooms now occupied by the Board of Education.

The Secretary then presented and read a paper entitled, "a brief account of the Minor Caves of Beira and Bajah, in the neighbourhood of Karli," given to him in a letter from Mr. N. L. Westergaard, accompanied by copies of the inscriptions, which the Secretary had rendered into English. On the motion of Dr. Burnes, it was resolved to return thanks to the Secretary for the communication now presented, and that it be published in the forthcoming number of the Society's Journal.

The thanks of the meeting were also voted to Lieut. Cruttenden for the Geological specimens forwarded, and to the Calcutta Society for the generous offer of their services, and the valuable books presented.

The meeting then adjourned to Thursday the 13th June, next.

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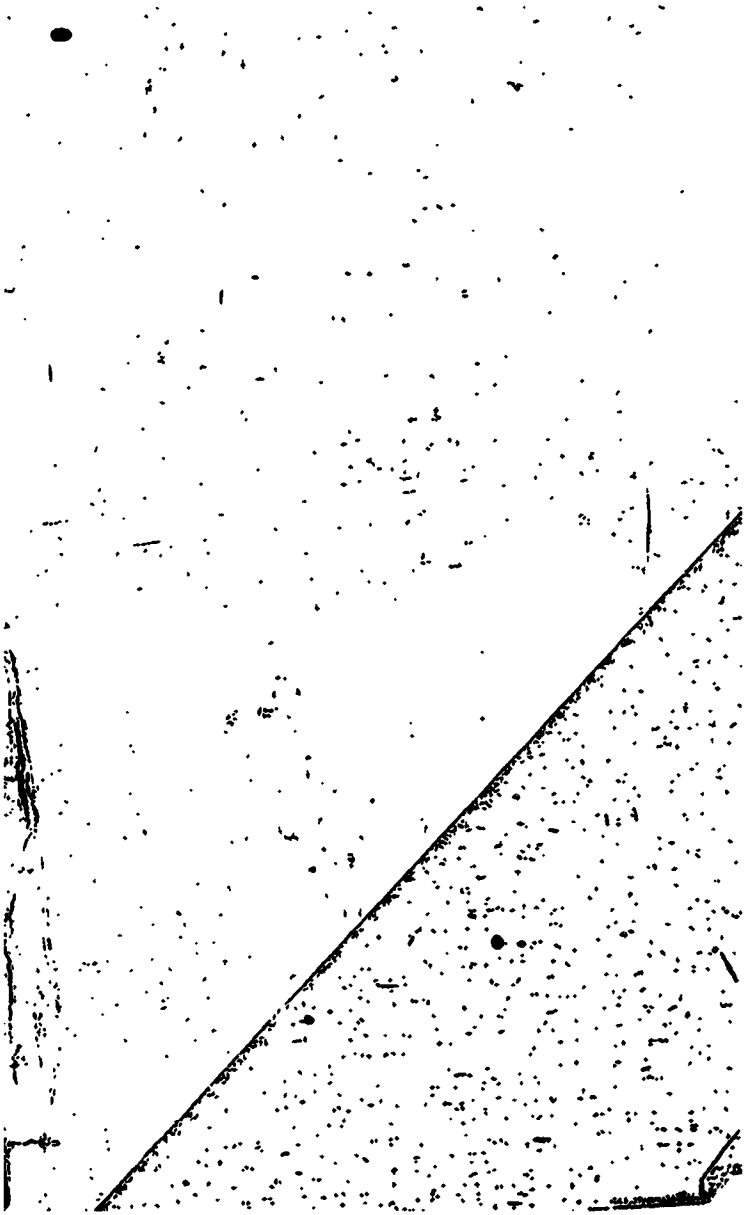

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